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Contents

Rising Inventive Competition of Great Britain 41
Apparel 45
Chemicals and Allied Products 45
Agricultural Chemicals 45
Plastics and Plasticizers 45
Paints, Varnishes and Lacquers 46
Chemical Engineering 46
Miscellaneous Chemicals 46
Electrical Machinery 49
Communication Equipment 49
Electronics 49
Miscellaneous 51
Food and Kindred Products 52
Fuels and Lubricants 52
Instruments 53
Leather and Leather Products 55
Lumber and Wood Products 55
Machinery 55
Medical 58
Metals and Metal Products 62
Meteorology and Climatology 66
Minerals and Mineral Products 66
Ordnance and Accessories 68
Photographic and Optical Goods 68
Physics 68
General 68
Physiology 69
Psychology 69
Transportation Equipment 70
Aeronautics 70
Aircraft 70
Instruments 73
Engines and Propellers 74
Aerodynamics 75
Marine Transportation 77
Water Supply 77
Miscellaneous 77
Patents 79
Chemicals and Allied Products 79
Electrical Machinery 80
Instruments 80
NEWSLETTER IN CENTER FOLD

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UNITED STATES DEPARTMENT OF COMMERCE

Charles Sawyer, Secretary

OFFICE OF TECHNICAL SERVICES

John C. Green, Director

February 1952

THE RISING INVENTIVE COMPETITION OF GREAT BRITAIN

A CHALLENGE TO U. S. DEVELOPMENT ENGINEERS AND MANUFACTURERS

Especially in diplomatic and state circles Great Britain has possessed for generations an ability to analyze her relative position in each field. When British industry was privately owned by financiers, many with limited managerial ability, the Government kept its hands off. The events of the past decade have changed this attitude. The British Government, now heavily involved financially in domestic industry, is keenly interested in industrial management and creative inventions.

We of American birth are prone to write off any possibility of industrial advancement under Government ownership. While the example of the Tennessee Valley Authority indicates some of the unsoundness of this hypothesis, nevertheless the rank and file of us have our fingers crossed on any type of Government ownership of industry.

On this assumption, many of us are now lulling ourselves into complacency about Great Britain's industrial competition. Her record of productivity in most industrial fields is far below our own and we are prone to depend upon Yankee ingenuity to maintain that differential.

Let us not overlook the fact that much of that low productivity can be traced to the policies of some of the older trade associations that permit prices to be set for all members of the association so that even the least efficient can make some profit. This places a high premium on inefficiency. Who amongst us would purchase high-priced efficient equipment if we could be assured a satisfactory income from our old machinery, which probably would have already depreciated to its salvage value?

Any observer in Great Britain will recognize that newer industries, without trade association protection, can be found that are as efficient as any in North American manufacturing in the same field. If any American observer will take time to visit the British Thermostat Company in suburban London, he will see a demonstration of instrument manufacturing equivalent to our own. As a result, that concern controls 80 per cent of the heat-control instrument business in Great Britain. A similar man-hour productivity can be witnessed in the new plant of L. Sterne and Company in suburban Glasgow, where a modern plant for the production of small refrigeration equipment is competing with American products successfully.

Some factors that might bring us a rude awakening at not too distant a date are worthy of serious consideration.

The British civil servant is first of all a loyal Britain. No matter which party is in power, his first interest is the welfare of his country. Only a relatively few employees of Government are directly affected by a change in Government leadership. Whether a high-ranking public servant is a member of the party which is in power or not, you can expect him to render his best service to the Crown for the development of his country.

This explains why so many high-ranking members of the opposition party who are public servants* can always be found doing excellent work even when their political leaders are on the shelf.

The British Government has deemed it necessary to come to the rescue of many defaulting commercial and industrial enterprises, especially those which have acquired world recognition, and has saved them for Great Britain from absorption by New York's Wall Street or other foreign financiers. The Government itself has taken over many of their assets in return for assured financial help and stability. A surprisingly large number of British concerns not officially nationalized have been financially undergirded and guided by British Government agencies for many years. The British Government, in a tradition quite unlike our American one, can go into partnership with an individual or corporation when deemed advisable, and an unsuspected number of British corporations have the Government as one of the principal stockholders.

Within the past six years Britain has nationalized some of her largest industries, and men who yesterday were ardent supporters of individual industrial enterprise now find themselves civil servants under the law. As Britains, they will carry on for their nation with a patriotic uprightness and allegiance for which they are renowned.

Thus, British industry is now a part of Government in a big way. Her top statesmen, many of whom are outstanding scientists, engineers and management executives, are giving these new Government-acquired national obligations a most analytical inspection. As a result of this appraisal they are diligently plugging the holes where their system is less effective than the American. They are fully as aware of their industrial handicaps as we are.

In basic or fundamental research they have kept several paces ahead of Americans in most fields. They are much more aware of the progress of the Americans in the scientific and engineering basic research fields than we are of their accomplishments. Their excellent support to their Department of Scientific and Industrial Research on the fundamental levels of scientific investigation can well be noted by our own planners in the National Science Foundation.

One of the principal instrumentalities in improving their industrial and scientific economic position is their Parliamentary and Scientific Committee, which in itself is an unofficial partnership of members of the Houses of Lords and of Commons on the one hand and members of the national scientific and engineering institutions and of recognized research organizations and bodies on the other.

In this group we find some two hundred members of Parliament associated with selected representatives of eighty scientific bodies, diligently working at the job of improving Britain's scientific, industrial and economic position.

Since industry is in itself becoming more and more a Government function, research and the resultant inventions have become essential parts of the program. The evolution, within the present system, of the recently Government-created National Research Development Corporation should cause us, as competitors, to sit up and take due notice.

As a result of World War I, the British Government set up the Royal Commission on Awards to Inventors in 1919 to appraise war-inspired discoveries and inventions and to determine the awards to be bestowed. The Commission completed its work in 1937 after making awards equivalent to six million dollars during its life span.

The work of this Royal Commission inspired new activity in invention by departments of Government of Great Britain. In 1930, a Central Committee on Awards was set up by the Treasury. Under the directive of the Treasury, the head of each Ministry or Department of the British Government was vested with the authority to determine what rewards should be made to inventors who were the employees of the particular Ministry or Department. These Departmental Award Committees were given the power to recommend to the head of the Department monetary awards to inventors up to one thousand pounds sterling. To maintain a uniform system, the British Treasury had one representative sit on each of the Departmental Award Committees.

*Public servants of Great Britain include all of the employees on the Government payroll except those elected to office, appointed to office for a limited time, or those who receive salaries by the hereditary process.

For the higher level awards the Central Committee of Awards, which is appointed in its entirety by the Treasury, can make awards up to ten thousand pounds sterling and may recommend to the Treasury and Parliament even greater awards. It also serves as an overall reviewing board for Departmental Award Committees.

Both the Departments and the Ministries found that one of their most difficult problems was that of giving an invention the proper business management after it was protected by patent. Through the efforts of the Department of Scientific and Industrial Research, the Imperial Trust was established at the close of World War I to properly exploit the Crown patents. This trust carried on for many years and had reasonable success in getting some of the more valuable Government-patented inventions into production. It could usually call upon the Ministry of Supply, the Post Office Department or one of the Defense Ministries to utilize the available inventions. However, the Imperial Trust found itself handicapped in that it had inadequate funds for the development of an invention that needed to be nurtured through the pilot-plant stage.

The Parliamentary and Scientific Committee studied this situation for some months. To add to the interest of the Committee in the problem, the failure of the Government to cover the discovery of penicillin by patents evoked much criticism. The availability of the Whittle patents on the gas turbine set afire their imaginations as to the possibility of obtaining American dollars by licensing United States manufacturers to use British Government-owned patents.

This study culminated in the Development of Inventions Act of 1948, in which Parliament authorized the Board of Trade to set up a National Research Development Corporation for:

(a) "Securing, where the public interest so requires, the development or exploitation of inventions from public research and of any other invention resulting from public research and of any other invention as to which it appears to the Corporation that it is not being developed or exploited or sufficiently developed or exploited."

(b) "Acquiring, holding, disposing of and granting rights (whether gratuitously or for consideration) in connection with inventions resulting from public research and, where the public interest so requires, in connection with inventions resulting from other sources."

The authorized Corporation came into existence June 28, 1949, when the Board of Trade appointed its members, with the Earl of Halsbury as Managing Director. It absorbed the assets and responsibilities of the Imperial Trust.

This corporation in addition to its other activities is now extending development aid to inventions that cannot be immediately put into production. While all Government patents are not funneled through this Corporation, patents that need special attention are given the time and expert attention essential to their development.

To complete the services essential to a Government-sponsored research and invention program, the British Government has also recreated the Royal Commission on Awards to Inventors, as of March, 1947, to serve as a tribunal on inventors' rights. This Commission, which carries the same title as its predecessor of World War I, is primarily an appeals tribunal. In a short period of time and at little expense to the public, the Commission decides on an inventor's equity in his patents as used by the Government; such decisions are made for both state and independent workers and on inventions in civil or defense equipment and in materials manufacture. This Commission has proven so satisfactory that seldom is a controversy routed to the higher courts of Britain; the inventors themselves prefer the Commission rulings.

In summation, the British Government has streamlined its incentive and development program on invention by:

(a) Making its strong interest tangibly known by honor and cash awards to inventors in the ministries and departments - first on a departmental level and finally on a top Treasury or Crown level.

(b) Creating a National Research Development Corporation which is acquiring, promoting and developing Government patents for the Government services and for British industry.

(c) Providing a quick inexpensive method of adjusting patent claims in its re-created Royal Commission on Awards to Inventors.

(d) Providing machinery for handling technical, commercial and legal matters for individuals and agencies, which are usually poorly equipped and inexperienced in effectively handling patents.

American scientists, engineers, and lawmakers might well study the working of the Parliamentary and Scientific Committee of Great Britain as an answer to finding a suitable way of giving our American Congress the same high-level service accorded Parliament by some eighty selected scientists and engineers of Great Britain who team up on special committees with two hundred members from the prevailing parties of the Parliamentary body.

Whether the United States develops a plan of licensing foreign nations to use any of the several thousand Government-owned patents for a monetary consideration, or prefers to follow a procedure of either granting a non-exclusive free license to selected foreign users, as well as American citizens, or of publishing discoveries is yet to be determined. Our principal immediate concern should be, can we do as complete a job in promoting our inventive skills, and are we as alert to their importance, as is one of our principal and preferred competitors, who is still doing an extensive business with its principal seat of Government on the Thames.

Britain has been well aware of her threatened insolvency and is doing a masterful job in extricating herself. Her citizenry are coming up in financial recovery and in industrial rehabilitation. The fact that a Labor Government is presently in the saddle does not mean that the Tories and Liberals are not equally concerned in re-establishing a strong British Empire. Great Britain's industrial competition is accelerating in healthy strides and Americans had better put their own muscles and brains and finances in good order to meet the British challenge.

Submitted by W. R. Woolrich
Dean, College of Engineering,
and Director, Bureau of
Engineering Research,
The University of Texas, Austin

APPAREL

RUBBER FOOTWEAR AND CLOTHING INDUSTRY. British Intelligence Objectives Sub-Committee. n.d. 45f diagr, tables Microfilm $2.50, Enlargement Print $7.50. PB 105734

1. Clothing, Rubber - Germany 2. Footgear, Rubber - Manufacture - Germany 3. Phoenix Rubber Works, Hamburg, Ger. 4. Treton & Calmon Gummiwerke A. G., Hamburg, Ger. 5. Continental Gummiwerke A. G., Hanover, Ger. 6. Radium Gummiwerke m.b.H., Dollbruck, Ger. 7. BIOS FR 475 8. Micro BIOS FD 3050/48, Frames 1-42.

Appendix A is glossary of German compounding ingredients, by Major Glen Gay.

CHEMICAL AND ALLIED PRODUCTS

Agricultural Chemicals

FUNGUS INHIBITIVE PROPERTIES OF ORGANIC COMPOUNDS, PART IV: THIOCYANOACETATE AND CHLOROACETATE ESTERS, by J. M. Leonard and V. L. Blackford. U. S. Naval Research Laboratory. Oct 1951. 7p tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. Mimeo: $.25. PB 105593

A series of twenty-four chloroacetate esters and a series of nineteen thiocyanoacetate esters have been subjected to fungus inhibitive assays. The latter group is by far the more active. Steric influences upon inhibition are discussed briefly. NRL R 3882.

SPECIFICATIONS AND METHODS OF ANALYSIS FOR CERTAIN INSECTICIDES, FUNGICIDES AND HERBICIDES, COMPILED by Dr. J. T. Martin. Gt. Brit. Ministry of Agriculture and Fisheries. Plant Pathology Laboratory. 1951. 74p diagr Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.65. PB 105615

1. Insecticides - Specifications - Gt. Brit. 2. Fungicides - Specifications - Gt. Brit. 3. Herbicides - Specifications - Gt. Brit.

S. O. Code no. 24-168-1-51. Technical bulletin no. 1.

Plastics and Plasticizers

INSULATING AND JACKETING COMPOUNDS FOR CABLES USED UNDER EXTREME CLIMATIC CONDITIONS: MONTHLY PROGRESS REPORT #12 MARCH 1949 UNDER CONTRACT NO. W-36-039-SC-36832, by W. H. Dibble, and K. M. Webb. United States Rubber Company. Bristol Plant, Bristol, R. I. Apr 1949. 15p tables Microfilm $1.75, Photostat $2.50. PB 105065

1. Insulating materials - Plastics 2. Plastics, Thermoplastic - Insulating properties 3. Polyethylenes - Insulating properties 4. Insulating materials - Synthetic rubber 5. Cables - Insulation - Tests 6. Low temperature research 7. Neoprene - Insulating properties.

Army Project #3-21-03-061-516A. Contents: Section I: Thermosetting synthetics, by W. H. Dibble. p. 2-13. - Section II: Thermoplastic synthetics, by K. M. Webb. p. 14-15.

METHYL METHACRYLATE AT ROHM & HAAS DARMSTADT, GER. B.I.O.S. TRIP NO. 1482, REPORTED by R. G. Tongue. British Intelligence Objectives Sub-Committee. Dec 1945. 17f drawings Microfilm $1.75, Enlargement Print $3.75. PB 105650

1. Plastics, Methacrylic - Germany 2. Röhm & Hass A. G., Darmstadt, Ger. 3. Plexigum (Trade name) 4. Plexiglas - Germany 5. BIOS FR 907. 6. Micro BIOS FD 3082/48, Frames 1-14.

Abstract included.

REPORT NO. 1-2, CONTRACT NO. W-36-039-SC-32011, JAN 15-JULY 14, 1946. Princeton University. Plastics Laboratory. Apr-Jul 1946. 54p diagrs, graphs, tables Microfilm $2.75, Photostat $7.50. PB 105607

1. Plastics - Research 2. Plastics - Dielectric properties 3. Plastics, Vinyl - Polymerization 4. Plastics, Melamine - Exchange reactions.

For other reports under this contract see PB 101817-101821, 103558, 103655-103656, 105608-105611.

REPORT NO. 3, CONTRACT NO. W-36-039-SC-32011, JUL 15-OCT 14, 1946. Princeton University. Plastics Laboratory. Oct 1946. 117p graphs (1 fold), tables Microfilm $4.75, Photostat $15.00. PB 105608

1. Plastics - Research 2. Plastics - Dielectric properties 3. Plastics, Thermosetting - Cure 4. Polystyrene - Crazing 5. Glass, Laminated - Electrical properties 6. Styrene - Molecular weight 7. Dielectrics - Constants.

For other reports under this contract see PB 101817-101821, 103558, 103655-103656, 105607, 105609-105611.

REPORT NO. 4, CONTRACT NO. W-36-039-SC-32011, OCT 15, 1946-JAN 14, 1947. Princeton University. Plastics Laboratory. Jan 1947. 65p graphs, tables Microfilm $3.00, Photostat $8.75. PB 105609

1. Plastics - Research 2. Plastics - Dielectric properties 3. Glass, Laminated - Electrical properties 4. Silicones - Properties.

For other reports under this contract see PB 101817-101821, 103558, 103655-103656, 105607-105608, 105610-105611.

REPORT NO. 8, CONTRACT NO. W-36-039-SC-32011, OCT 15, 1947-JAN 14, 1948. Princeton University. Plastics Laboratory. Jan 1948. 77p graphs, tables Microfilm $3.50, Photostat $10.00. PB 105610

1. Plastics - Research 2. Plastics - Dielectric properties 3. Plastics, Thermosetting - Cure 4. Arc resistance.

For other reports under this contract see PB 101817-101321, 103558, 103655-103656, 105607-105609, 105611.

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REPORT NO. 9, CONTRACT NO. W-36-039-SC-32011, JAN 15-APR 14, 1948. Princeton University. Plastics Laboratory. Apr 1948. 108p diagrs, graphs, tables Microfilm $4.50, Photostat $13.75.
PB 105611

1. Plastics - Research 2. Plastics - Dielectric properties 3. Plastics, Thermosetting - Cure 4. Polystyrene - Crazing 5. Glass, Laminated - Electrical properties 6. Arc resistance.

For other reports under this contract see PB 101817-101821, 103558, 103655-103656, 105607-105610.

TRIALLYL CYANURATE CROSS-LINKED POLYESTER RESINS, by R. G. Nelb and P. M. Elliott. United States Rubber Co. Naugatuck Chemical Division, Naugatuck, Conn. May 1950. 30p drawing, graphs, tables Microfilm $2.00, Photostat $3.75.
PB 105570

Laminates prepared by crosslinking selected heat-stable unsaturated polyester resins with triallyl cyanurate have shown unusually good resistance to high temperature aging tests. This new heat resistant system has flexural strengths, both at room temperatures and at 260°C., as good as, if not better, than melamine-formaldehyde laminates. The system was made flame resistant by incorporating a halogenated dibasic acid in the alkyd or by facing a polyester core with single plies of a melamine-formaldehyde resin. Technical report no. 3 under Contract N8-onr-504, Task order no. 1, Amendment no. 1, Project no. NR033-248.

VISIT TO DYNAMIT A. G., TROISDORF. B. I. O. S. TRIP 2825. British Intelligence Objectives Sub-Committee. n.d. 2f Microfilm $1.25, Enlargement Print $1.50. PB 105652

1. Resins, Casting - Preparation - Germany 2. BIOS FR 1037 3. Micro BIOS FD 3087/48, Frames 1-2.

Paints, Varnishes and Lacquers

BEACH SOIL STABILIZATION - ANILINE-FURFURAL METHOD, by R. H. Henley, H. J. Sieland and E. R. Holden. U. S. Naval Civil Engineering Research and Evaluation Laboratory, Port Hueneme, Calif. Sep 1950. 34p photos, tables Microfilm $2.00, Photostat $3.75. PB 105174

1. Sands, Beach - Stabilization with resins 2. Resins, Furan - Uses 3. Roads - Surface treatment - Soil compaction 4. NCEREL R-001.

Technical report R-001. Project NY-140 001-3.

DEVELOPMENT OF AN ELECTRICAL INSULATING VARNISH WITH HIGH AND LOW TEMPERATURE RESISTANCE. SIXTH AND FINAL REPORT ON CONTRACT NO. W36-039-SC-36866, 1 OCTOBER 1949 TO 17 JANUARY 1950, by Lee T. Smith and E. Armstrong. Vita-Var Corporation, Newark, N. J. Jan 1950. 46p tables Microfilm $2.50, Photostat $6.25.
PB 105672

1. Varnishes, High temperature resistant 2. Insulating varnishes.

Chemical Engineering and Equipment

AUTOMATIC ALIQUOT PIPETTE (PETLIN), by Arthur C. Peters. U. S. Chemical Corps. Chemical and Radiological Laboratories, Army Chemical Center, Md. Aug 1951. 11p photos, tables Microfilm $1.75, Photostat $2.50. PB 105695

1. Pipettes 2. CC CRL IR 34.

Project 4-08-04-005.

GERMAN LABORATORY EQUIPMENT, REPORTED BY MAJOR D. C. EVANS. B. I. O. S. TRIP NO. 1358, OCT-NOV 1945. C.I.O.S. BLACK LIST ITEMS 8 AND 22. British Intelligence Objectives Sub-Committee. n.d. 10f Microfilm $1.25, Enlargement Print $2.50. PB 105729

1. Laboratory equipment - Germany 2. BIOS FR 63 3. Micro BIOS FD 3010/48, Frames 1-8.

ROTATING TROMMEL CRYSTALLIZER, RAVO RAPID SPRAY DRIER AND CERTAIN ACID PLANTS, TRIP 1482 TO ZAHN & CO., BERLIN. British Intelligence Objectives Sub-Committee. n.d. 15f Microfilm $1.75, Enlargement Print $3.75.
PB 105720

1. Zahn & Co., G.m.b.H., Berlin 2. Crystallization - Machinery - Design - Germany 3. Evaporators - Design - Germany 4. Sulfuric acid - Production - Germany 5. Sulfates, Ferrous - Recovery - Germany 6. BIOS FR 1397 7. Micro BIOS FD 1068/49, Frames 1-14.

Abstract included. See also FD 3170/47, for drawings and catalog.

SPECIAL JACKETED PRESSURE VESSELS. British Intelligence Cbjectives Sub-Committee. n.d. 23f photos, drawings (Text in German and English) Microfilm $2.00, Enlargement Print $5.00.
PB 105723

1. Pressure vessels - Design - Germany 2. Chemical industry - Instruments and apparatus - Design - Germany 3. Samesreuther & Co., G.m.b.H., Butzbach, Ger. 4. BIOS FR 1866 5. Micro BIOS FD 1148/49, Frames 1-11.

Abstract included. Includes article reprinted from Chemische fabrik 13:28; (1940): Untersuchung von geschweissten doppelwanddampffässern der chemischen industrie (Investigation of welded jacketed steam vessels in the chemical industry) by E. Bloch.

Miscellaneous Chemicals

ALKALI METAL PHOSPHIDES, II: DISODIUM PHOSPHIDE NA_2P, by E. Charles Evers, Stanley Roggenburg, Evan H. Street and Shee Lup Jung. Pennsylvania. University. Thermodynamics Research Laboratory. Feb 1950. 19p tables Microfilm $1.75, Photostat $2.50. PB 105548

Li_2P, Na_2P, and K_3P_2 were prepared by reacting white P dissolved in PhMe with commercial-grade metals in homogeneous liquid NH_3 solutions at the NH_3 b.p.; dimeric salt structures were postulated. K_3NaP_2 and K_3LiP_2 were formed by the reduction of K_3P_2 with Na and Li, respectively. A green to orange-yellow color change denoted the end point; polyphosphides were formed by further reaction. Contract N8 onr-74200.

ANNUAL AND, IN PART, TERMINAL REPORT COVERING RESEARCH ON ORGANIC FLUORINE COMPOUNDS UNDER CONTRACT N6ORI-107, TASK ORDER II, OCT 1, 1948 TO JUNE 30, 1950. Duke University. Dept. of Chemistry. Jul 1950. 20p tables Microfilm $1.75, Photostat $2.50. PB 105260

1. Chemical compounds, Organic - Fluorination 2. Fluorine compounds - Organic - Research.

CHEMISTRY OF COPOLYMERIZATION, AN INTERIM REPORT OF PROJECT NO. N6ORI-206 T/O II ON COPOLYMERIZATION, by Turner Alfrey, Jr., Paul Agron, John Bohrer, Howard Haas, Harry Wechsler. Polytechnic Institute of Brooklyn, Brooklyn, N. Y. n.d. 76p graphs, tables Microfilm $3.50, Photostat $10.00. PB 105259

1. Copolymerization - Research.

Supplement A is PB 99399.

CONVENIENT SYNTHESIS OF MONALKYLPYRIDINES. TECHNICAL REPORT UNDER CONTRACT N7ONR-394, TASK ORDER III. PROJECT NR056127, by Herbert C. Brown and Wilbur A. Murphy. Purdue University. Dept. of Chemistry, Lafayette, Ind. Oct 1950. 24p tables Microfilm $2.00, Photostat $3.75. PB 105581

Monoalkylpyridines containing Et, iso-Pr, and tert-Bu groups were synthesized by treating picoline with $NaNH_2$ and Me halide. Two procedures were used. First, procedure A, in which excess CH_3Cl was reacted with an alkylpyridine in the presence of excess $NaNH_2$, was applied to the 2-derivatives. For example, 2-picoline(I) was converted at 15 to 20°C to 2-ethylpyridine (II) in 51 to 66% yields; at 125 to 130°C, I was converted to 2-isopropylpyridine (III) in 58% yields. When attempts to prepare 4-ethylpyridine (IV) from 4-picoline (V) by this procedure gave about equal amounts of IV, V, and 4-isopropylpyridine, procedure B was developed. With this method, the alkylpyridine was added to a liquid NH_3 suspension of $NaNH_2$ and the alkyl halide was added rapidly or slowly depending on the particular conversion. This procedure was satisfactory with the 2-, 3-, and 4-derivatives. For example, II was converted to III in 73% yields with a reaction time of 19 min.; III gave 2-tert-butylpyridine in a 60% yield with a reaction time of 8 hrs.; 3-picoline gave 3-ethylpyridine in yields of 54% with a reaction time of 16 min. and V gave IV in a 72% yield with a reaction time of 10 to 17 min. Mechanisms of these reactions are discussed. The alkylation of 3-alkylpyridines by this method was stressed in view of the fact that such compounds are not usually considered to possess active α-H's.

ELECTROLYTICAL PRODUCTION OF HYDROGEN, AND AN OIL HARDENING PROCESS. Bamag-Meguin A. G., Berlin. 1933-1945. 69f photos, drawings, graphs (Text in German) Microfilm $3.00, Enlargement Print $10.00. PB 105660

1. Hydrogen - Electrolysis - Germany 2. BIOS FR 1395 3. Micro BIOS DOCS 1482/2697 4. Micro BIOS FD 3112/47, Frames 1-39+28.

English abstract included. Some frames will not reproduce well. Includes reprint from Chemische fabrik, no. 6149, 1933: Moderne grossbatterien zur elektrolytischen wasserstofferzeugung (Modern large scale batteries for the elektrolytic production of hydrogen) by A. E. Zdansky.

ETHER MANUFACTURE, REPORTED BY K. NICKLES. B.I.O.S. TRIP NO. 2348, TARGET NO. C22/146: C. F. Boehringer und Soehne, Mannheim, Waldorf. British Intelligence Objectives Sub-Committee. n.d. 4f drawing Microfilm $1.25, Enlargement Print $1.50. PB 105722

1. Ether, Diethyl - Production - Germany 2. Boehringer, C. F. & Söhne G.m.b.H., Mannheim, Ger. 3. BIOS FR 1864 4. Micro BIOS FD 1147/49, frames 1-3.

See also BIOS FR 740 (PB 47724). Abstract included.

FLUORESCENCE STUDIES OF SOME SIMPLE BENZENE DERIVATIVES IN THE NEAR ULTRAVIOLET, II: TOLUENE AND BENZONITRILE, by Arnold M. Bass. Duke University. Dept. of Physics, Durham, N. C. Submitted by H. Sponer. May 1950. 33p photos, tables Microfilm $2.25, Photostat $5.00. PB 105293

The fluorescence spectra of PhMe (I) and PhCN (II) were studied. Fluorescence was produced by light from a Hg arc and from HV sparks condensed between electrodes of Ni, Al, Fe, and Mn for I, and Fe, Mn, and Cu for II. The sparks were operated at 10,000 v. and 1 kw. with a capacitor of 0.025 uf. The spectra were photographed with a Bausch and Lomb medium quartz spectrograph having a dispersion of 9.5 A/mm. in the region observed. Discrete spectra were observed in the near ultraviolet for I and II. The spectrum of I extends from 2667 to 3400 A and consists of 103 bands which appear to degrade to the red region. The spectra of II, with Mn excitation, shows 130 bands extending from 2735 to 2990 A. The values obtained agreed with those of the absorption spectra. The 407 $cm.^{-1}$ vibration was assigned the symmetry α_2; this band was not reported in the absorption or emission spectra. Assignments were made for some of the vibrations in accordance with the symmetry properties of the molecules.

Technical report no. 4 on Contract N6-ori-107, Task order I, NR019106.

HERSTELLUNG VON ZIRCONOXYDGEL DURCH UMSETZUNG VON ZIRCONOXOCHLORID MIT XTHYLENOXYD (PRODUCTION OF ZIRCONIUM OXIDE GEL BY REACTION OF ZIRCONIUM OXY-CHLORIDE WITH ETHYLENE OXIDE). HERSTELLUNG VON TONALON. (PRODUCTION OF TONALON). AUFARBEITEN DER WÄSSRIGEN ÄTHYLENCHLORHYDRINLÖSUNG ZWECKE HERSTELLUNG VON 100% IGEM CHLORHYDRIN (AQUEOUS SOLUTION OF ETHYLENE CHLOROHYDRIN FOR THE PREPARATION OF 100% CHLOROHYDRIN). I. G. Farbenindustrie A. G., Oppau, Ger. Feb 1940. 17f diagrs (Text in German) Microfilm $1.75, Enlargement Print $3.75. PB 105445

1. Zirconium oxide - Production - Germany 2. Tonalon (Trade name) 3. Chlorohydrin - Production - Germany 4. Micro BIOS FD 720/50, Frames 1-16.

English abstract included. Abstract available as PB 105445s. 1p. Microfilm $1.25, Photostat $1.25.

HYDRAULIC JETS AT LOW REYNOLDS NUMBER AND CONSTANT WEBER NUMBER, by G. M. Asset and P. D. Bales. U. S. Chemical Corps. Medical Laboratories, Army Chemical Center, Md. Jun 1951. 21p photos, drawings, graph, tables Microfilm $2.00, Photostat $3.75. PB 105506

When Weber number was kept constant at 10.3 and Reynolds number was varied from 240 to 9000, hydraulic jets changed from the varicose type to the sinuous type. The appearance of irregularities in the jet occurred at a Reynolds number between 1320 and 3150 about half way down the jet. The ratio of drop-diameter to orifice diameter varied from 1.93 to 1.00 decreasing with increasing Reynolds number and decreasing Froude number. CC MD RR 64.

HYDROLYSIS OF 2-FLUOROQUINOLINE IN ACID SOLUTION, by William K. Miller, Samuel B. Knight and Arthur Roe. North Carolina. University. Venable Chemical Laboratory. 1950. 7p graphs Microfilm $1.25, Photostat $1.25. PB 105449

The hydrolysis of 2-fluoroquinoline to 2-hydroxyquinoline (I) was indicated by the behavior of pH vs. extinction coefficient curves at 272 and 324 μ; a maximum of extinction occurred instead of the usual leveling, and extinction decreased with decreased pH. The maximum was explained in terms of the weak basicity of I; the decrease was explained by the salt formation of I which began at the pH of decreasing extinction (0.5 to 0.0). The coefficient theoretically decreases until the pH is sufficiently small (negative) to prevent hydrolysis of the salt. Hydrolysis of 2-chloroquinoline did not proceed in acid solution at normal temperatures; hydrochloride formation resulted in strongly acid media.

LOW TEMPERATURE HEAT CAPACITIES OF INORGANIC SOLIDS. I: HEAT CAPACITY OF BORIC ACID FROM 16 TO 296 K. DESCRIPTION OF THE OHIO STATE SOLID CALORIMETERS, by Herrick L. Johnston and Eugene C. Kerr. Ohio State University Research Foundation, Columbus, Ohio. Jul 1944. 14p photo, diagr, graph, tables Microfilm $1.75, Photostat $2.50. PB 105081

1. Boric acid - Thermal properties 2. Calorimeters - Design 3. Low temperature research 4. Ohio State University. Cryogenic Laboratory, Columbus, Ohio.

Technical report no. 3 on Project RF-283. Contract N6 onr-225, T. O. IV, ONR project no. NR 058038: Low temperature thermodynamics of inorganic substances.

IODINE, ITS PROPERTIES AND TECHNICAL APPLICATIONS. Chilean Iodine Educational Bureau, Inc., New York City, N. Y. 1951. 77p Available free from Chilean Iodine Educational Bureau, Inc., 120 Broadway, New York 5, N. Y. PB 105283

1. Iodine - Properties 2. Iodine - Uses 3. Iodine compounds - Reactions.

MEANING OF THE TERM OF POLHÖHE, by C. Schaler. May 1951. 3p Microfilm $1.25, Photostat $1.25. PB 105305

METHOD FOR DETERMINING MOLECULAR WEIGHTS OF NON-VOLATILE COMPOUNDS, by Daphne Schiff and H. Sheffer. Canada. Defence Research Board. Defence Research Chemical Laboratories. Jan 1950. 6p drawing, graph, table Microfilm $1.25, Photostat $1.25. Limited supply available free from Defence Research Board, Dept. of National Defence, Ottawa, Canada. PB 105552

An adaptation of the isopiestic method to determine the extent of solvation of macro-molecules in solution is described. A simple McBain-Bakr balance was, however, used for equilibriation of solutions to equal vapor pressure in order to measure molecular weights of non-volatile compounds. Only 1-100 mgm of the unknown are required, and the material can be readily recovered if desired. T he method is most suitable for the determination of low molecular weights the upper limit being about 1,000. Report no. 40.

ORGANIC CHEMICAL PRODUCTION, by W. Hunter and H. C. Raine. Deutsche Gold und Silberscheideanstalt, Frankfort, Ger. n.d. 25f Microfilm $2.00, Enlargement Print $5.00. PB 105644

1. Chemical compounds, Organic - Production - Germany 2. BIOS FR 752 3. Micro BIOS FD 3067/48, Frames 1-23.

Abstract included

PHOTOCHEMICAL SYNTHESIS OF HYDRAZINE FROM AMMONIA, BY H. E. GUNNING, ALLAN KAHN, DAVID L. KANTRO, ROBERT J. SCOTT AND ROBERT A. UPHAUS, COVERING THE PERIOD JULY 1-DEC 31, 1949. Illinois Institute of Technology. Dept. of Chemistry, Chicago, Ill. Mar 1950. 36p diagrs, graph, tables Microfilm $2.25, Photostat $5.00. PB 105568

1. Ammonia - Photolysis 2. Hydrazine - Production. Final report under Contract no. N7onr-32908.

POTENTIALS OF CELLS WITH LIQUID-LIQUID JUNCTIONS, by D. C. Grahame and J. I. Cummings. Amherst College. Dept. of Chemistry, Amherst, Mass. Nov 1950. 15p diagr, table Microfilm $1.75, Photostat $2.50. PB 105583

Potentials were measured for cells of the type: Ag, AgCl, M_1Cl (0.1 N)/M_2Cl (0.1 N) AgCl, Ag, where M_1 and M_2 are simple ions such as K^+, NH_4^+, Ba^{+2}, or La^{+3}. The results were roughly in agreement with the demands of the Henderson equation for liquid junction potentials but disagreed with the results of previous investigators whenever KCl was 1 of the electrolytes. An equation is derived which gives the potentials of such cells with a mean deviation of 0.2 to 0.6 mv. depending on the valence types of the 2 electrolytes. It is shown that the Henderson equation and that of Lewis and Sargent probably relate to the potentials of whole cells containing the liquid junction in question. Technical report no. 5 under Contract N8-onr-66903, Project no. NR-051-150.

PREPARATION OF HIGH PURITY SILVER CHLORIDE AND SILVER BROMIDE, by W. Zimmerman, III. U.S. Naval Research Laboratory. Oct 1951. 8p photos Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. Mimeo: $.25. PB 105595

A procedure for the preparation of high purity silver halides is described. For silver chloride the pro-

cedure involves reduction with zinc, solution of the metal in nitric acid, evaporation and separation of the mother liquor from the silver nitrate crystals, precipitation of silver chloride, solution in ammonium hydroxide, and crystallization from ammonium hydroxide solution. The procedure for silver bromide is similar with the substitution of hydrobromic acid for hydrochloric acid, and the elimination of the final crystallization from ammonia solution. The products obtained by this procedure are of high purity, with usually less than 0.005% metallic impurities. NRL R 3879.

PREPARATION OF TRIMETHYLHYDRAZINE. TECHNICAL REPORT ON CONTRACT N6 ONR-269, T. O. III, by J. G. Aston. Pennsylvania State College. Cryogenic Laboratory, State College, Pa. Jan 1951. 4p Microfilm $1.25, Photostat $1.25. PB 105547

N, N-dimethyl-N'-methylenehydrazine (I) was prepared by adding 100 ml. 40% HCHO to 70 ml. of a concentrated aqueous solution of N, N-dimethylhydrazine. NaOH pellets were added; the upper layer was separated and fractionated. The fraction boiling at 70-71°C was collected. $LiAlH_4$ in dry Et_2O reduced I, turning the metal complex into a gelatinous mass which was dissolved by 1:1 HCl. After the solution was evaporated to a heavy syrup, it was dropped on NaOH pellets and distilled to 100°C. Fractionation yielded 49.3% of the theoretical, the compound boiling at 59°C.

VAPOR PRESSURE OF INORGANIC SUBSTANCES, V: TANTALUM BETWEEN 2624° and 2943° K, by James W. Edwards, Herrick L. Johnston, and Paul E. Blackburn. Ohio State University. Dept. of Chemistry, Cryogenic Laboratory, Columbus, Ohio. Jul 1950, 15p drawing, graph, tables Micorfilm $1.75, Photostat $2.50. PB 105549

The vapor pressure of Ta was determined between 2624° and 2948°K by measuring the rate of metal-surface evaporation in vacuum. Values of ΔH_8 calculated from individual vapor pressures showed no appreciable trend; an average of 185.5 ± 0.3 kg.-cal. was obtained. The vapor-pressure equation $R \ln p = -1.85 \times 10^3/T + 3.7 \times 10^{-4}T - 8.4 \times 10^{-8}T^2 + 32.87$, where R is the gas constant, p the pressure in atm., and T the absolute temperature, was developed by combining the average ΔH_8 with free-energy functions for solid and gaseous Ta. (Contractor's abstract). Project RF-281, TR 281-6. Technical report no. 6 under Contract N6 onr-225, T.O. I, ONR project no. NR 058031.

VISCOSITIES OF AIR AND NITROGEN AT LOW PRESSURES, by Herrick L. Johnston, Robert W. Mattox and Robert W. Powers, Ohio State University. U. S. National Advisory Committee for Aeronautics. Nov 1951. 22p graphs, tables Microfilm $2.00, Photostat $3.75. PB 105690

Information is presented of the results of an investigation to measure the viscosities of nitrogen and air at 306° and 273°K at pressures from 500 to 0.0005 millimeter of mercury and at 194° and 79° K at pressures down to 0.3 millimeter of mercury. NACA TN 2546.

ELECTRICAL MACHINERY, EQUIPMENT AND SUPPLIES

Communication Equipment

COILS, COIL WINDING MACHINES, AND RADIO COMPONENTS IN GERMANY, REPORTED BY J. P. ROGERS, E. B. GREENWOOD, W. H. WARD, J. J. SMITH, P. D. CANNING. BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE. B.I.O.S. TRIP NO. 2368. 1946. 303f photos, drawings, diagrs Microfilm $9.00, Enlargement Print $41.25. PB 105726

1. Coils - Manufacture - Germany 2. Radio - Components - Manufacture - Germany 3. Winding equipment - Germany 4. BIOS FR 1860 5. Micro BIOS FD 2059/49, Frames 1-302.

Abstract included.

ON THE CONTROL OF MAGNETIC AMPLIFIERS, by R. A. Ramey. U. S. Naval Research Laboratory. Oct 1951. 12p photos, diagrs, graphs Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. Mimeo: $.50. PB 105747

The various functional elements comprising magnetic amplifiers are separated and described. By use of a practical single-core magnetic amplifier circuit, several methods of control are illustrated and analyzed. These include both linear methods such as a resistance and, particularly, nonlinear methods such as a rectifier, a rectifier combination, or a reactor combination. In addition, thyratron and triode control are discussed. Experimental data from an electronically controlled amplifier is used for demonstration. It was found that in several of the illustrations, the magnitude of the control circuit current does not affect the output quantity. This work is intended to broaden the understanding of magnetic amplifier operation. NRL R 3869.

Electronics

DETERMINATION OF MICROWAVE ATMOSPHERIC ABSORPTION USING EXTRATERRESTRIAL SOURCES, by M. Schulkin. U. S. Naval Research Laboratory. Oct 1951. 30p graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. Mimeo: $.75. PB 105592

Basic expressions for microwave radiometer computations of atmospheric absorption, equivalent galactic radiation temperature, and the equivalent temperature of the sun and moon have been derived from the Rosseland equation of transfer of radiation applied to the earth's atmosphere. The expressions are general, except for the exclusion of a scattering term for ray paths through precipitation, clouds, and atmospheric turbulence. However they include the complications of atmospheric refraction and earth curvature. The limitations of the original Dicke analytical technique near 24,000 megacycles with respect to radiometer applications at other radio frequencies are pointed out, and possible refinements are examined in the light of later microwave-

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absorption studies of water vapor and oxygen. Sample computations are given for predicting atmospheric absorption at 3-centimeter wave-length based on meteorological data for Washington, D. C. NRL R 3843.

ELEKTRISCHE VERHALTEN ELEKTRONEGATIVER GASE (BEHAVIOR OF ELECTRO-NEGATIVE GASES) ÜBERSCHLAGSPANNUNGEN VON ISOLATOREN UNTER ERHÖHTEM LUFTDRUCK (FLASH-OVER VOLTAGES OF INSULATORS UNDER INCREASED AIR PRESSURE), by Werner Weber. Siemens-Schuckertwerke A. G., Berlin. 1941-1942. 21f diagrs, graphs, tables (Text in German) Microfilm $2.00, Enlargement Print $5.00. PB 105641

1. Gases - Electrical properties - Germany 2. Insulation, Electrical - Germany 3. Insulators, High voltage - Germany 4. Micro BIOS FD 1446/49, Frames 1-20.

Reprinted from Archiv für elektrotechnik, jahrg 35, no. 12, 1941 and jahrg. 36, no. 3, 1942.

FACTORS AFFECTING THE WIDTH AND SHAPE OF ATMOSPHERIC MICROWAVE ABSORPTION LINES, by Thomas F. Rogers. U. S. Air Force. Electronics Research Division, Cambridge Research Center, Cambridge, Mass. Oct 1951. 50p graphs, table Microfilm $2.50, Photostat $6.25. PB 105588

The various factors which affect the broadening of a microwave absorption line are studied. Natural, Doppler, collision, high-pressure and high-power density broadening factors are considered and their influence on the frequency dependence of absorption is studied quantitatively for the general conditions of temperature and absolute and partial pressures known to exist throughout the earth's lower atmosphere. Particular emphasis is placed on a study of the validity and limitations of the Van Vleck-Weisskopf collision-broadening equation which is fundamental to the entire field of atmospheric microwave absorption. AAF ERL E 5078.

FUNDAMENTAL NATURAL CONCEPTS OF INFORMATION THEORY, by Edward W. Samson. U. S. Air Force. Electronics Research Division. Communications Laboratory, Cambridge Research Center, Cambridge, Mass. Oct 1951. 21p diagrs Microfilm $2.00, Photostat $3.75. PB 105738

An analysis of fundamental concepts is based on a typical objective system and a collective of experience. The principal measure concepts that arise correspond to strong natural intuitional mental concepts associated with events or systems of events. These concepts are expectation, surprise and uncertainty. Influence, unknown except as the agent producing particular events, is an objective counterpart of surprise. The mathematical counterparts of the concepts are p, $-\log p$, and $-\sum_i p_i \log p_i$, and are called probability, surprisal and uncertainty. AAF ERL E 5079.

INVESTIGATION AND RESEARCH PERTAINING TO THE DEVELOPMENT AND DESIGN OF ELECTROLYTIC CAPACITORS FOR LOW TEMPERATURE OPERATION. FINAL REPORT UNDER CONTRACT NO. W-36-039-SC-36846, by L. W. Foster. General Electric Co. Capacitor Engineering Division, Pittsfield, Mass. Apr 1950. 29p photos, graphs, tables Microfilm $2.00, Photostat $3.75. PB 105600

This project was worked in as part of a broad developmental program being conducted by the General Electric Company directed towards the development of tantalum electrolytic capacitors. Tantalum material in sintered-slug form and foil form used as electrode material for capacitors in conjunction with suitable electrolytes has been thoroughly investigated. The object of this contract has been met and samples delivered for applications as outlined on Page 4 of this report. We feel confident that tantalum foil type electrolytic capacitors will give the greatest flexibility of design and we feel confident also that the development of pure tantalum material will increase the voltage rating considerably higher than the 150 volt rating which has been standardized on at the present time. The Signal Corps should find wide application of these capacitors in their miniaturization program for electronic and signal equipment. The tantalum electrolytic capacitor should make it possible to drastically reduce the size of a great many specialized military equipment used by all branches of the service. Dept. of the Army project: 3-26-00-600. Signal Corps project: 2006. Contains: Report on laboratory tests of 4 MFD., 150 volt, non-polar etched foil capacitors, design 29F405, made for the Squier Signal Laboratories, by R. A. Ruscetta, signed by F. W. Grahame, April 18, 1950. Approved, R. A. Ruscetta. p. 5-12.

NEW INSTRUMENT FOR THE RAPID MEASUREMENT OF CAPACITOR TEMPERATURE COEFFICIENTS, by John A. Connor. U. S. Naval Research Laboratory. Oct 1951. 31p photos, diagrs, graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. Mimeo: $1.00. PB 105746

"A radically new type of instrument has been designed to make rapid measurements of the temperature coefficients of capacitance (TC) of small temperature-compensating capacitors. This instrument is based upon a "slope-comparison" technique which compares directly an unknown TC value with a standard TC capacitor. This technique subjects the test specimen and standard capacitors to identical thermal-pulse conditions and compares the initial slopes of the resulting capacitance transients. In this method, long thermal-stabilization intervals are not required, thus allowing a measurement within only a few minutes. For these measurements, a bridge circuit is employed which allows one standard TC capacitor to be compared with a wide range of test specimens, differing both in capacitance and in TC value. The test set designed on these new principles has consistently given results which correlate satisfactorily with evaluations made by a more elaborate and and time-consuming "classical" technique. The advantages gained over previously available methods are most apparent in the increased speed of measurement, the reduced cost of the measuring apparatus, and the extreme reduction in equipment size. NRL R 3860.

PHASE AND GROUP VELOCITIES OF VERTICALLY POLARIZED ELECTROMAGNETIC WAVES IN THE DIFFRACTION REGION AT THE SURFACE OF THE EARTH, by Henry Lisman. U. S. Signal Corps En-

gineering Laboratories, Fort Monmouth, N. J. May 1951. 40p graph, table Microfilm $2.25, Photostat $5.00. PB 105601

Expressions are derived for phase and group velocities of the diffracted wave at the surface of the earth. Then, using various combinations of dielectric constants and conductivity, the velocity of propagation is calculated for a frequency of 5.305 Mc/s, which is the carrier frequency used in the Raydist equipment. Radiation from this equipment is vertically polarized, and, therefore, only this type of polarization is considered. Dept. of the Army project: 3-99-03-021. Signal Corps project: 182A. SCEL TM M-1320.

PROGRESS REPORT FOR APRIL-JUNE 1951. National Research Council of Canada. Radio and Electrical Engineering Division. Jul 1951. 37p photos, diagrs, col. drawing, graphs Microfilm $2.25, Photostat $5.00. Also available from National Research Council of Canada, Ottawa, Canada. Limited supply for free distribution. PB 105272

1. Engineering, Electrical - Canada 2. Electronics - Canada 3. Radar - Canada 4. Radiophysics - Canada 5. NRCC ERA-209.

Color in drawing will not reproduce.

RESEARCH ON CRYSTAL DETECTORS OF IONIZING RADIATION. 1ST QUARTERLY PROGRESS REPORT, JUNE 1, 1949-1 OCT 1949, UNDER CONTRACT W-36-039-SC-44530: USE OF SCINTILLATION COUNTERS IN STUDY OF THE COMPTON EFFECT AT HIGH ENERGIES, by Robert Hofstadter. Princeton University. Dept. of Physics. Oct 1949. 38p photos, diagrs, graph, tables Microfilm $2.25, Photostat $5.00. PB 105553

An investigation has been carried out, by means of high speed coincidence techniques using stilbene scintillation counters, of the angular distribution of scattered gamma rays in the Compton effect at 100 mev. The work was performed at Berkeley, California at the Radiation Laboratory of the University of California, with the 335 mev synchrotron. The results show that the accuracy of the experiment, about $\pm$ 10%. New techniques were developed in obtaining these results and a new type of gamma ray detector was devised which employs stilbene and lead plates. Large stilbene crystals were grown successfully. Army project: 3-99-04-062. Signal Corps project 26-196 B-O.

WELDED GERMANIUM CRYSTALS. FINAL REPORT UNDER CONTRACT OEMSR-262, ORDER NO. DIC-178554, by H. Q. North. Separate sections, by E. F. Hennelly, E. I. Alessandrini, W. C. Hahn. General Electric Co., Schenectady, N. Y. Sep 1945. 61p photos, drawing, diagrs, graphs Microfilm $3.00, Photostat $8.75. PB 105586

1. Crystals, Germanium 2. Frequency changers, Germanium crystal 3. Frequency changers, Microwave 4. Radar - Band X 5. Germanium - Conductivity 6. Analyzers, Harmonic 7. NDRC Div 14.

Continuation of work begun under OEMsr-1377 (See PB 5206). Contains also: Welded high voltage units, by E. F. Hennelly. - Electron diffraction pictures of germanium surfaces. - I. F. negative resistance in germanium crystals, June 23, 1945.

Miscellaneous

FUNDAMENTAL RESEARCH ON RAW MATERIALS USED FOR ELECTRON EMISSIVITY ON INDIRECTLY HEATED CATHODES. SUMMARY REPORT OF WORK ACCOMPLISHED ON CONTRACT N7ONR-389, TASK ORDER NO. NR-074-251, COVERING PERIOD FROM 1 JUN 1947 TO 1 JUL 1950, PREPARED by Dr. W. B. Nottingham, James Cardell, Irving E. Levy. Raytheon Manufacturing Co., Newton, Mass. Jul 1950. 71p photos, diagr, graphs, tables (part fold) Microfilm $3.50, Photostat $10.00. PB 105579

1. Cathodes, Indirectly heated - Emission 2. Coatings, Oxide 3. Electron metals - Spectrochemical analysis 4. Electron metals - Mechanical properties 5. Vacuum tubes, Cathode.

HIGH TENSION INSULATION. Siemens-Schuckertwerke A. G., Berlin. 1939-1944. 40f photos, graphs, tables (Text in German) Microfilm $2.25, Enlargement Print $6.25. PB 105642

1. Insulation, Electrical - Germany 2. Electrical equipment - Safety precautions - Germany 3. Micro BIOS FD 1447/49, Frames 1-38.

English abstract included. Contents: Bemessung der isolation elektrischer hochspannungsanlagen (Evaluating the insulation of electrical high tension installations) by E. Estorff. (Reprinted from Elektrotechnische Zeitschrift, jahrg. 60, no. 28/29, 1939). - Neue wege in der auswahl der isolation auf grund der beanspruchung im betrieb (New methods of choosing insulation on the basis of practical requirements) by E. Estorff (Reprinted from Elektrotechnische Zeitschrift 1941, no. 15/16). - Bedeutung der isolationsbemessung für den betrieb elektrischer hochspannungsanlagen (Significance of insulation evaluation in high tension installations) by E. Estorff. (Reprinted from Electrizitätswirtschaft, jahrg. 41, no. 5, p. 98-103, Mar. 5, 1942). - Erfassen der inneren überspannungen in hochspannungsanlagen (Determination of the internal over-voltage in high tension installations) by E. Estorff (Reprinted from Elektrotechnische zeitschrift, jahrg. 65, no. 19/20, May 17, 1944). - Sicherheitsgrad und betriebssicherheit elektrischer hochspannungsanlagen (Safety grading and working safety in high tension installations) by E. Estorff (Reprinted from Elektrotechnische zeitschrift jahrg. 65, no. 47/48, 1944).

ILLUMINATED CONTROL PANELS. Siemens-Schuckertwerke A. G., Berlin. n.d. 18f photos, diagrs (Text in German) Microfilm $1.75, Enlargement Print $3.75. PB 105638

1. Panels, Control - Germany 2. Micro BIOS FD 1449/49, Frames 1-17.

English abstract included. Contents: Betriebsvereinfachung in der berg- und hüttenindustrie durch zentrale überwaschung und befehlstellung (Leuchtwarten) (Simplification of working conditions in the mining and metallurgical industries by central supervision and control (Illuminated panels). - Leuchtwarten in industrienanalagen (Illuminated panels in industrial plants) by Kurt Funke. - Leuchtwarten für wasserwerke (Illuninated panels for water-works) by Georg Appel.

PRELIMINARY SURVEY OF ABSTRACTING AND BIBLIOGRAPHICAL SERVICES IN THE FIELD OF

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RADIOBIOLOGY, COMPILED BY MAUREE WASHINGTON AYTON. PREPARED FOR THE OFFICE OF NAVAL RESEARCH UNDER CONTRACT NA ONR-13-47. U. S. Library of Congress. Navy Research Section. Jul 1950. 9p Microfilm $1.25, Photostat $1.25. PB 105354

1. Radiobiology.

STATIC ELECTRIFICATION. FINAL REPORT UNDER CONTRACT N7ONR 295, TASK ORDER IX, PROJECT NO. NR017-201, SEP 2, 1947 TO AUG 31, 1950, UNDER THE DIRECTION OF Leonard B. Loeb. California. University. Dept. of Physics. 1950. 24p diagrs, graph, tables Microfilm $2.00, Photostat $3.75. PB 105582

The influences of static electrification on aerodynamics, meteorology, and industrial processes led to a study of the nature of the phenomenon. A review of various experiments on electrification is presented. Includes Appx. 1: Spray electrification, by E. E. Dodd. - Appx. 2: Influence of the piezoelectric effect upon tribo-electrification, by John W. Peterson. - Appx. 3: Charging by sliding friction in controlled atmospheres, by John W. Peterson.

TUBE LABORATORY MANUAL. Massachusetts Institute of Technology. Research Laboratory of Electronics. Jul 1951. 103p diagrs, tables (2 fold) Microfilm $4.50, Photostat $13.75. PB 105743

1. Laboratories, Vacuum tube - Manuals.

Foreword is signed by Fred Rosebury.

VARIABLE THICKNESS LOW TEMPERATURE INFRARED CELL, by Robert B. Holden, William J. Taylor, and Herrick L. Johnston. Ohio State University. Dept. of Chemistry. Cryogenic Laboratory, Columbus, Ohio. Jul 1950. 19p photos, drawings Microfilm $1.75, Photostat $2.50. PB 105551

An infrared absorption cell has been designed and constructed for use at low temperatures. This cell incorporates flat silver-chloride windows and possesses a mechanism for varying the sample thickness with the cell in place. The present cell is satisfactory for use down to about liquid hydrogen temperatures but, with some minor changes, can be redesigned for use at lower temperatures. Technical report no. 8 under Contract N6onr-225, Task order XV, ONR project no. NR 019113. TR 328-8.

FOOD AND KINDRED PRODUCTS

GERMAN BREAD AND BISCUIT PLANT INDUSTRY, REPORTED BY A. W. DUMBRILL AMD J. PELKMAN. BRITISH INTELLIGENCE OBJECTIVES SUBCOMMITTEE. TRIP NO. 1757 AND 1757A. JAN 17 AND APR 25, 1946. Apr 1946. 8f Microfilm $1.25, Enlargement Print $2.50. PB 105735

1. Food machinery - Germany 2. Werner & Pfleiderer, Stuttgart, Ger. 3. Draiswerke G.m.b.H., Mannheim, Ger. 4. Hengler & Cronemayer, Krefeld, Ger. 5. BIOS FR 578 6. Micro BIOS FD 3059/48, Frames 1-8.

FUELS AND LUBRICANTS

DISCREPANCIES BETWEEN THEORETICAL AND OBSERVED BEHAVIOR OF CYCLICALLY LOADED BEARINGS, by R. W. Dayton, E. M. Simons and F. A. Fend. U. S. National Advisory Committee for Aeronautics. Nov 1951. 27p diagr, drawing, graphs Microfilm $2.00, Photostat $3.75. PB 105575

Discrepancies between theory and the experimental behavior of a cyclically loaded shaft rotating in a sleeve bearing are analyzed. For constant loads rotating at one-half the frequency of shaft rotation, eccentricity ratios were found to be unity when kerosene was used to lubricate the test bearing. This agrees with theoretical predictions. However, when SAE 10 oil was used, the eccentricity ratios were reduced. Under the latter conditions, the eccentricity ratio decreased as the shaft speed increased. Refinements of the test conditions resulted in observed eccentricity ratios which were closer to the theoretically predicted value of unity. NACA TN 2545.

HEAT CAPACITY LAG IN GASES, by Richard Walker. U. S. National Advisory Committee for Aeronautics. Nov 1951. 40p graphs, table Microfilm $2.25, Photostat $5.00. PB 105712

A review is presented of the literature on the sonic studies of the problem of the excitation of molecular vibrations by collision and the theory on which the interpretation of almost all the sonic work has been based is discussed. The principal experimental programs are described and most of the available results are included in a table. NACA TN 2537.

HIGH TEMPERATURE REACTIONS, BY COURTLAND L. AGRE. TECHNICAL REPORT NO. 1 UNDER CONTRACT N8-ONR-73700, NR055-182, PERIOD JAN 1949-JUN 30, 1950. St. Olaf College, Northfield, Minn. Jul 1950. 31p graphs, tables Microfilm $2.25, Photostat $5.00. PB 105580

This study is concerned with the reaction of trichlorosilane (I) on unsaturated molecules at temperatures above the reactant b.p.'s. Three flow sheets showing the interrelationship of a large no. of related silanes are presented. I and trichloroethylene reacted to form 2,2-dichlorovinyltrichlorosilane at about 500°C; optimum operating conditions were determined. Mono-, di-, and tri-Cl- and Br-substituted Et and vinyl trichlorosilanes were synthesized and studied. Transformations of the tribromoethylene-I system were determined in a pyrolysis furnace and a pressure bomb; the pyrolytic product was 2-bromoethynyltrichlorosilane. The reactions and products of I with 15 unsaturated compounds were observed; details are given for the reactions with acetylene, cis- and trans-dichloroethylene, and vinylidene chloride. Bomb runs made on 10 systems of unsaturated compounds with Si- and non-Si-containing materials were investigated. Threatened explosions terminated reactivity studies of dichloroacetylene. Includes Preparation and reactions of a, B-dichlorovinyltrichlorosilane, by C. L. Agre, reprinted from Journal of the American Chemical Society, 71:300, 1949.

HYDRODYNAMIC LUBRICATION OF CYCLICALLY LOADED BEARINGS, by R. W. Dayton and E. M. Simons. U. S. National Advisory Committee for Aeronautics. Nov 1951. 76p photos, diagrs, graphs Microfilm $3.50, Photostat $10.00. PB 105689

Results are presented of an experimental investigation conducted in order to check the validity of analytical studies of simple cases of cyclic loading and to determine the effect of the loading conditions on hydrodynamic lubrication when the load diagram is so complex that analytical treatment is difficult or impossible. A precise test bearing was set up to which constant or varying unidirectional loads or constant rotating loads could be applied, singly or together, and the effect of the load diagram on hydrodynamic lubrication was measured from the attitude of the journal in the bearing. NACA TN 2544.

INFRARED SPECTRA OF 59 DICYCLIC HYDROCARBONS, by K. T. Serijan, I. A. Goodman and W. J. Yankauskas. U. S. National Advisory Committee for Aeronautics. Nov 1951. 37p diagrs, tables Microfilm $2.25, Photostat $5.00. PB 105714

The infrared spectra are presented for 59 dicyclic hydrocarbons consisting of some diphenylalkanes, dicyclohexylalkanes, alkylbiphenyls, and alkylbicyclohexyls ranging from C_{12} to C_{18}. The physical properties of these compounds, which were available in a high state of purity, are tabulated for reference purposes. NACA TN 2557.

OIL WELL TUBING, DETAILS OF BORING TOOL, by John Young. British Intelligence Objectives Sub-Committee. B.I.O.S. trip 1482. n.d. 2f Microfilm $1.25, Enlargement Print $1.50. PB 105647

1. Haniel & Lueg, G.m.b.H., Düsseldorf, Ger. 2. Petroleum - Well drilling - Germany 3. Drills, Oil well - Germany 4. BIOS FR 844 5. Micro BIOS FD 3073/48, Frames 1-2.

PRODUCTION, CONSUMPTION, AND USE OF FUELS AND ELECTRIC ENERGY IN THE UNITED STATES IN 1929, 1939, AND 1947, by William H. Leyon and D. S. Colby. U. S. Bureau of Mines. Oct 1951. 95p tables (part fold) Microfilm $4.25, Photostat $12.50. Limited supply available free from U. S. Bureau of Mines, 4800 Forbes St., Petersburgh 13, Pa. PB 105605

1. Fuels - Consumption 2. Fuels - Production 3. Fuels - Uses 4. Electric power distribution 5. Electric power industry - Statistics 6. Electric power production 7. BM RI 4805.

REPORT ON VISIT TO THE MINING RESEARCH ESTABLISHMENT AT DERNE NEAR DORTMUND, NOV. 30, 1945. British Intelligence Objectives Sub-Committee. B.I.O.S. trip 1481. 1945. 21f photos, drawings, tables Microfilm $2.00, Enlargement Print $5.00. PB 105658

1. Coal mines and mining - Research - Germany 2. Coal mines and mining - Electrical systems - Germany 3. Berggewerkschaftliche Versuchsstrecke, Dortmund-Derne, Ger. 4. BIOS FR 1194 5. Micro BIOS FD 3095/48, Frames 1-9.

SPECIALIST CONFERENCE ON FUEL RESEARCH, LONDON, JULY 1950: REPORT OF CONFERENCE. British Commonwealth Scientific Official Conference. 1951. 16p tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.25. PB 105216

1. Fuels - Congresses - Gt. Brit. 2. Fuels - Research - Gt. Brit. 3. Conferences, Scientific - Gt. Brit.

S. O. Code no. 88-1305.

TECHNISCH-WIRTSCHAFTLICHE BERICHTE (TECHNICAL-ECONOMIC REPORTS). Germany. Reichskohlenrat. Sep 1940. 39f photos, diagrs, graphs, tables (Text in German) Microfilm $2.25, Enlargement Print $6.25. PB 105639

1. Coke, Low temperature - Germany 2. Coke, Low temperature - Tar content - Germany 3. Fuels, Solid - Germany 4. Micro BIOS FD 1394/49, Frames 1-37.

English abstract included. Contents: Schüttgewicht und schüttungswarmeinhalt als kenngrössen feste kraftstoffe, insbesondere von schwelkoks (Unconsolidated weight and heat content as characteristics of solid fuels, especially low-temperature coke) by E. Rammler, K. Breitling and W. Loibl. - Trommel-und sturzfestigkeit von festen kraftstoffen, insbesondere von schwelkoks (Resistance of solid fuels, especially low-temperature coke, to disintegrating action and dumping) by E. Rammler, O. Augustin and K. Breitling (Reprinted from Feuerungstechnik jahrg 27, no. 10-11, 1939). - Über das verhalten von schwelkoks gegen feuchtigkeit (Behavior of low-temperature coke under conditions of moisture) by E. Rammler, K. Breitling and E. Gall (Reprinted from Feuerungstechnik jahrg. 28, no. 8, 1940. (Also issued as Bericht D88 of the Reichskohlenrat). - Über den resteergehalt von schwelkoks im hinblick auf seine verwendung als fester kraftstoff (On the residual tar content of low-temperature coke as affecting its use as a solid fuel) by E. Rammler and J. Gall.

INSTRUMENTS

ADJUSTABLE SPHEROMETER, by Theodore R. Whitney, John Onisko and Joe M. Mapes. U. S. Naval Ordnance Test Station, Inyokern, Calif. Jan 1950. 18p photos, drawings, graphs, tables Microfilm $1.75, Photostat $2.50. PB 105742

A spherometer is described for measurement of the radii of curvature of lenses, mirrors, and optical tools. Three sets of legs are provided, with a difference of one inch between the sets of legs. A contact-pressure element, located in the spindle, is a liquid-filled capillary, with several folds of a glass bellows as a bulb. When compressed a small amount, it causes the liquid to rise in the column an amount proportional to the ratio of areas between the average cross section of the bulb and that of the capillary. A range of $\pm$ 0.5 in. sagittal movement can be obtained from the micrometer thread and $\pm$ 1.0 in. more through the use of the interchangeable legs. The circularly engraved scale has a least count of 0.0001 in. in sagittal measurement. NAVORD 1213. NOTS 269.

DEVICE FOR THE PRODUCTION OF DELAYED SIDE TONE, by Nathan B. Marple IV and Scott N. Morrill. U. S. Naval School of Aviation Medicine, Naval Air Station, Pensacola, Fla., and Ohio State University Research Foundation, Columbus, Ohio. Aug 1951. 29p photos, diagrs Microfilm $2.00, Photostat $3.75. PB 105503

Part I of this report describes the Audio Signal Delaying Unit, a machine that was constructed to provide a time delayed side tone for use in experiments in acoustics, speech, and psychology. By the use of a magnetic tape recorder with a fixed playback and a movable record head, and the use of a high tape speed (60-65 inches per second), continuously adjustable time delays were obtained from a minimum of 0.02 second to a maximum of 0.35 second. The signal-to-noise ratio of the machine was about 40 db, with essentially uniform frequency response from 90 to 8000 c.p.s. A simple method for measuring the time delay introduced by the machine, requiring only an a.c. voltmeter and calibrated audio oscillator as additional equipment is also described. Part II of this report is description of a portable model with improved frequency response. Notes on construction and operation are included. Joint project report no. 8 under Contract N6 onr-22525, project NR 142-992 and Bureau of Medicine and Surgery project NM001064.01.08.

EIN PRAKTISCHES LATERALEXTENSOMETER ZUR BESTIMMUNG DER SPANNUNGSSUMME (A PRACTICAL LATERAL-EXTENSOMETER FOR COMPUTING TOTAL TENSION) CIVIL ENGINEERING AND BUILDING CONSTRUCTION SERIES, VOL. 2, NR. 3 (ALSO KUNGL. TEKNISKA HÖGSKOLANS HANDLINGAR NR 42), by Rudolf Hiltscher. 1950. 21p photos, graphs (Text in German) Microfilm $2.00, Photostat $3.75. PB 105276

1. Extensometers - Sweden 2. Tension - Measurement - Sweden 3. Acta polytechnica no. 77 4. Sweden. Kungl. Tekniska Högskolan. Handlingar no. 42.

Acta polytechnica 77.

INSTRUCTIONS FOR THE CHALK RIVER MICROBALANCE, by M. M. Hughes and H. Carmichael. National Research Council of Canada. Atomic Energy Project. Apr 1951. 25p photo, fold drawings, fold graph Available from National Research Council of Canada, Ottawa, Canada. $.20. PB 105564

The report contains full directions for setting up, calibrating and using the microbalance and for replacing damaged suspensions. The illustrations include a photograph of the microbalance and a sectional scale drawing, and also detailed drawings of the equipment for handling and replacing the all-quartz suspension. The maximum permissible load on each side, including the scale pans, is 0.3 grain. The largest weight difference directly measurable on the torsion head is about 2 mg. The smallest weight detectable, with the regular suspension, is 10^{-8} gram. More sensitive suspensions can be provided. CR GP-472. NRCC 2490. NRCC AEP CR GP 472.

INVESTIGATION BY THE HODOGRAPH METHOD OF FLOW THROUGH A SYMMETRICAL NOZZLE WITH LOCALLY SUPERSONIC REGIONS, by F. Edward Ehlers and Hirsh G. Cohen. U. S. National Advisory Committee for Aeronautics. Nov 1951. 61p diagrs, graphs, tables Microfilm $3.00, Photostat $8.75. PB 105713

To study the flow of a compressible fluid through a channel having locally supersonic regions, the Tricomi equation is used in the hodograph variables as an approximation in the sonic region to the equation of flow of an irrotational, inviscid gas. A one-parameter family of solutions of the Tricomi equation is used which provides symmetrical accelerated-decelerated flows. Variation of this parameter alters the Mach number at the center of the throat, the velocity distribution and gradient along the center streamline, as well as the shape of the channel, that is the curvature of the bounding streamline. Other solutions to the Tricomi equation are discussed which may be used to formulate channel flows. NACA TN 2547.

MANUFACTURE OF ALARM CLOCKS, BY S. D. TOWNSEND, B.I.O.S. TRIP 2255 ON BEHALF OF THE AUSTRALIAN SCIENTIFIC AND TECHNICAL MISSION. British Intelligence Objectives Sub-Committee. Jun 1946. 4f Microfilm $1.25, Enlargement Print $1.50. PB 105643

1. Clocks, Alarm - Manufacture - Germany 2. Jahresuhren Fabrik A. Schatz Sohn, Triberg, Ger. 3. BIOS FR 721. 4. Micro BIOS FD 3065/48, Frames 1-4.

Documents relating to this report are BIOS DOCS 2255/667 (FD 542/47).

OFFICE MACHINE INDUSTRY, REPORTED BY W.E. BLOCK AND R. B. PULLIN ON CASH REGISTERS, POSTAL FRANKERS, CALCULATORS. British Intelligence Objectives Sub-Committee. Dec 1945. 6f Microfilm $1.25, Enlargement Print $2.50. PB 105732

1. Cash registers - Germany 2. Calculators - Germany 3. Postal franking machines - Germany 4. Francotyp (Trade name) 5. Anker Werke A. G., Bielefeld, Ger. 6. Brunsviga Maschinenwerke, Grimm-Natalis & Co., Brunswick, Ger. 7. BIOS FR 385 8. Micro BIOS FD 3041/48, Frames 1-6.

ON THE SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS WITH DIGITAL COMPUTING MACHINES. PHYSICS AND APPLIED MATHEMATICS SERIES VOL. 1 NR. 9 (ALSO KUNGL. FYRIOGRAFISKA SÄLLSKAPETS I LUND FÖRHANDLINGAR, BD 20, NR 11, by Carl Erik Fröberg. 1950. 18p diagrs, tables Microfilm $1.75, Photostat $2.50. PB 105278

1. Equations, Differential - Sweden 2. Computers, Digital - Sweden 3. Acta polytechnica no. 79.

Acta polytechnica 79.

SCIENTIFIC AND TECHNICAL CALCULATING MACHINES, CONTROLLED BY CALCULATION-SCHEMES, by K. Zuse. Luftfahrtforschungeanstalt Herman Göring E. V., Volkenrode, Ger. n.d. 63f drawings Microfilm $3.00, Enlargement Print $10.00. PB 105737

1. Calculators - Germany 2. Micro BIOS HEC 10563.

Ministry of Supply translation MOS 47.

STRING FILTER AND ITS UTILIZATION POSSIBILITIES, by Dr. Ing. Habil, Friedrich Vilbig. U. S. Materiel Command. Electronics Research Laboratories, Cambridge, Mass. Sep 1951. 124p photo, diagrs, graphs, table Microfilm $5.00, Photostat $16.25. PB 105561

In Monograph I the construction of the filter and the elimination of the various sources of error are discussed. Monograph II deals with applications of this filter which is easily manipulated. A new measurement method for phase adjustment of the filters so that their characteristics overlap in the half-power points is discussed. Monograph III shows that, within the frequency range of the filter, a constant phase shift not affecting the amplitude response can be produced. Monograph IV describes use for frequency multiplication. Frequency-band division with the help of a string filter is discussed in Monograph V. Monograph VI shows how the string filter can be used as a clipper and as a multitone frequency generator. In Monograph VII, finally, the behavior of the string filter in the presence of single impulses, random noise and wobble frequencies is discussed. AAF ERL E 5077.

LEATHER AND LEATHER PRODUCTS

GENERAL SURVEY OF THE GERMAN FOOTWEAR INDUSTRY, by Kaisar Ahmad. British Intelligence Objectives Sub-Committee. n.d. 17f Microfilm $1.75, Enlargement Print $3.75. PB 105646

1. Footgear - Manufacture - Germany 2. Leather - Tanning - Germany 3. Shoe industry - Germany 4. Norddeutsche Lederwerke A. G., Neumünster, Ger. 5. Schmid, Hermann G., Lederfabrik, Neumünster, Ger. 6. Meridian Schuhfabrik, Bahrenfeld, Ger. 7. Floering, Adolf, Wirmelskirchen, Ger. 3. Salamander Schuhfabrik, Kornwestheim, Ger. 9. Hoffmann, Gustav, G.m.b.H., Schuhfabrik, Cleve, Ger. 10. Ada-Ada Schuh A. G., Hochst/Frankfort, Ger. 11. BIOS FR 808 12. Micro BIOS FD 3071/48, Frames 1-17.

REPORT OF THE GERMAN LEATHER INDUSTRY IN THE BRITISH ZONE OF OCCUPATION, by Karel Stark. British Intelligence Objectives Sub-Committee. B.I.O.S. trip no. 2846. Nov 1946. 35f Microfilm $2.25, Enlargement Print $6.25. PB 105653

1. Leather - Tanning - Germany 2. Leather industries - Germany 3. Norddeutsche Lederwerke A. G., Neumünster, Ger. 4. Knecht, Johannes & Söhne, Elmshorn, Ger. 5. Metzger, G., & Söhne, Pinneberg, Ger. 6. Schmid, Hermann G., Lederfabrik, Neumunster, Ger. 7. Immergan (Trade name) 8. BIOS FR 1073 9. Micro BIOS FD 3088/48, Frames 1-33.

LUMBER AND WOOD PRODUCTS

GERMAN COMPOSITION CORK INDUSTRY, REPORTED by H. C. Rabbatts, W. R. Baker, G. M. Burnell. British Intelligence Objectives Sub-Committee. B.I.O.S. trip 2627. Sep 1946. 16f Microfilm $1.75, Enlargement Print $3.75. PB 105654

1. Cork - Manufacture - Germany 2. Alster, Ander, Presskorkwerke, Hamburg, Ger. 3. Hassler & Sommer, Hamburg, Ger. 4. Rieck, Wilhelm O. P., G.m.b.H., Hamburg, Ger. 5. Alfelder Korkwaren Fabrik, Alfeld, Ger. 6. Kappe, Gebruder, Alfeld, Ger. 7. Heuer & Wegener, Brunkensen, Ger. 8. Frobana Maschinen Fabrik, W. Barmen, Ger. 9. Barmag Lennep, Solingen, Ger. 10. Dichtungsring, Gesellschaft, Stuttgart, Ger. 11. Greiner, G. L. & Söhne, Nutringen, Ger. 12. Subarit-Fabrik, Wurttemberg, Ger. 13. Korkfabrik Frankenthal, Bender & Co., G.m.b.H., Frankenthal, Ger. 14. Badische Maschinenfabrik, Durlach, Ger. 15. BIOS FR 1083 16. Micro BIOS FD 3089/48, Frames 1-14.

BTS 800/97. Abstract included.

ON DISTILLATES FROM FIR STUMPS, PART III: INVESTIGATION OF ROSIN ACIDS. CHEMISTRY INCLUDING METALLURGY SERIES, VOL. 2, NR. 8 (ALSO KUNGL. TEKNISKA HÖGSKOLANS HANDLINGAR NR 40), by Nils Hellström. 1950. 42p graphs, tables Microfilm $2.50, Photostat $6.25. PB 105275

1. Resin acids - Sweden 2. Fir - Distillation products - Sweden 3. Acta polytechnica no. 75 4. Sweden. Kungl. Tekniska Högskolan. Handlingar no. 40.

Acta polytechnica 75.

PROPERTIES AND USES OF COMMERCIALLY IMPORTANT JAPANESE WOODS, by H. D. Bruce, R. A. Cockrell, and Lawrence J. Cummings. Supreme Commander for the Allied Powers. Natural Resources Section. Oct 1951. 73p drawing, tables Microfilm $3.50, Photostat $10.00. PB 105557

1. Wood - Properties - Japan 2. Wood - Uses - Japan 3. SCAP NRS 147.

MACHINERY

ABRASIVE WHEELS, HELPFUL HINTS ON THEIR MARKING, DIMENSIONING, AND ORDERING. U. S. Bureau of Ships. Oct 1951. 15p drawings, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.25. PB 105505

1. Wheels, Abrasive 2. Abrasives 3. NAVSHIPS IN no. 115.

ALL PURPOSE WORK HOLDER. U. S. Navy Dept. Office of Procurement and Material. Jan 1945. 2p drawings Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D.C. $.25. PB 105699

1. Clamps 2. NAVSHIPS IN 30.

CARBIDE TIPPED HAND SCRAPERS. U. S. Navy Dept. Office of Procurement and Material. May 1945. 3p drawings Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D.C. $.25. PB 105705

1. Scrapers, Steel - Carbide tipped 2. NAVSHIPS IN 40.

CEMENTED CARBIDE TIPS; REUSE OF. U. S. Navy Dept. Office of Procurement and Material. Apr 1945.

4p drawings Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.25. PB 105703

1. Tools, Cutting - Carbide tipped 2. NAVSHIPS IN 37.

DESIGN DATA SHEETS: DESIGN OF HELICAL COMPRESSION SPRINGS. Gt. Brit. Ministry of Supply. Armament Design Establishment. Apr 1951. 76p diagrs, drawings, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.25. PB 105215

1. Springs, Helical - Design - Gt. Brit.

S. O. Code no. 70-658.

DIAMOND DRESSING TOOLS; USE, CARE AND MAINTENANCE. U. S. Navy Dept. Office of Procurement and Material. Oct 1944. 4p drawing, diagrs, table Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.25. PB 105708

1. Diamond tools - Maintenance and repair 2. Grinding wheels, Diamond impregnated - Maintenance and repair 3. NAVSHIPS IN 24.

DIAMOND WHEELS; CARE AND MAINTENANCE. U. S. Navy Dept. Office of Procurement and Material. Jan 1945. 4p photos, diagr Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.25. PB 105700

1. Diamond tools - Maintenance and repair 2. Grinding wheels, Diamond impregnated - Maintenance and repair 3. NAVSHIPS IN 31.

DIE HEADS; CARE, AND MAINTENANCE OF. U. S. Navy Dept. Office of Procurement and Materials. Dec 1944. 2p Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.25. PB 105698

1. Dies - Maintenance and repair 2. NAVSHIPS IN 29.

DRAWINGS RELATING TO TEMPERING FURNACES. "Ofu" Ofenbau-Union G.m.b.H., Düsseldorf, Ger. n.d. 37f drawings only (Legends in German and English) Microfilm $2.25, Enlargement Print $6.25. PB 105637

1. Furnaces, Tempering - Design - Germany 2. Micro BIOS FD 373/51, Frames 1-5+23.

DRUCKVERTEILUNG UND LAST IM 180°-GLEITLAGER IM BERICH DER GEDRUNGENHEITEN (VERHÄLTNIS DURCHMESSER ZU LÄNGE) B-O BIS B-8 FÜR DIE EXZENTRIZITÄTEN C-0.2 BIS 0.95 (PRESSURE DISTRIBUTION AND LOAD IN A 180° JOURNAL BEARING FOR THE DIFFERENT VALUES OF THE CORPULENCE (RATIO OF DIAMETER TO LENGTH) B-O TO B-8 FOR ECCENTRICITIES C-0.2 TO C-0.95) by A. Walther and H. Sassenfeld. 1950. 24p diagrs, graphs, tables Microfilm $2.00, Photostat $3.75. PB 105197

1. Bearings, Journal - Load - Germany 2. Bearings, Journal - Pressure distribution - Germany 3. Darmstadt. Technische Hochschule. Institut für Praktische Mathematik 4. DSIR SR 14.

Translation of Institut für Praktische Mathematik der Technische Hochschule, Darmstadt. Lager-und schmierungsprobleme bericht nr. 10.

EINFLUSS DER VERFORMUNG UND DER LAGERFEHLER AUF DIE TRAGFÄHIGKEIT VON ZAHNRADGETRIEBEN. TEIL VI: VERTEILUNG DER BELASTUNG BEI BERÜCKSICHTIGUNG DER VERFORMUNG DES RITZELKÖRPERS UND DER ZÄHNE. DURCHRECHNUNG DER FÜNF SONDERFÄLLE. TEIL VII: DAS EINFACHSCHRÄGVERZAHNTE RITZEL. VERTEILUNG DER BELASTUNG BEI BERÜCKSICHTIGUNG DER VERFORMUNG DES RITZEL KÖRPERS UND DER ZÄHNE (DEFORMATION OF LOADED GEARS AND THE EFFECT ON THEIR LOAD-CARRYING CAPACITY. PART VI: DISTRIBUTION OF LOAD WITH REGARD TO THE DEFORMATION OF THE BODY AND TEETH OF THE PINION. COMPUTATION OF FIVE SPECIAL CASES. PART VII: SINGLE HELICAL GEARED PINION. DISTRIBUTION OF LOAD WITH REGARD TO THE DEFORMATION OF THE BODY AND TEETH OF THE PINION), by C. Weber and K. Banaschek. Jun 1950. 112p drawings, diagrs, tables Microfilm $4.75, Photostat $15.00. PB 105198

1. Gears - Deformation - Germany 2. Gears - Load distribution - Germany 3. Braunschweig. Technische Hochschule. Institut für Maschinenelemente 4. DSIR SR 15.

For parts 1-5 see PB 104677-104680. For pt. 8 see PB 105199. Translation of Institut für Maschinenelemente, Technische Hochschule, Braunschweig. Einzelbericht nr. 122.

EINFLUSS DER VERFORMUNG UND DER LAGERFEHLER AUF DIE TRAGFÄHIGKEIT VON ZAHNRADGETRIEBEN. TEIL VIII: ENTSTEHUNG DES ZAPFENFEHLERS (DEFORMATION OF LOADED GEARS AND THE EFFECT ON THEIR LOAD CARRYING CAPACITY, PART VIII: DISPLACEMENTS IN THE JOURNAL BEARING), by C. Weber. Sep 1950. 6p diagrs, graphs Microfilm $1.25, Photostat $1.25. PB 105199

1. Gears - Deformation - Germany 2. Gears - Load distribution - Germany 3. Bearings, Journal - Displacement - Germany 4. Braunschweig. Technische Hochschule. Institut für Maschinenelemente 5. DSIR SR 16.

For parts 1-7 see PB 104677-104680, PB 105198. Translation of Institut für Maschinenelemente, Technische Hochschule, Braunschweig. Einzelbericht nr. 128.

ERFAHRUNGEN MIT ROLLEN AUS KUGELLAGERSTAHL UND NITRODUR BEI DEN VERSUCHEN AN DEN WALZENPRÜFSTÄNDEN MIT LINIENBERÜHRUNG AN GEHÄRTETEN PRÜFLINGEN (RESULTS OF EXPERIMENTS ON DISC-TESTERS WITH ROLLERS OF BALL-BEARING STEEL AND "NITRODUR" IN LINEAR CONTACT WITH HARDENED TEST PIECES), by K. W. Kraupner. Oct 1950. 10p photos Microfilm $1.25, Photostat $1.25. PB 105201

1. Roller bearings - Tests - Germany 2. Roller bearings - Testing equipment - Germany 3. Steel - Hardness tests - Germany 4. Nitrodur 81 (Trade name) 5. Braunschweig, Technische Hochschule. In-

stitut für Maschinenelemente 6. DSIR SR 20.
Translation of Institut für Maschinenelemente, Technische Hochschule, Braunschweig. Einzelbericht nr. 132.

FUNDAMENTAL STUDY OF THE SLAGGING OF NAVAL BOILER REFRACTORIES AND THE DISCOVERY OF SLAG FORMING SUBSTANCES IN NAVY STANDARD FUEL OIL. FINAL REPORT, 15 OCT 1947 TO 30 JUNE 1950, ON CONTRACT N6ORI-193, Dr. John H. Koenig, Director; Dr. W. A. Lambertson, Investigator; Dr. R. B. Sosman, Faculty adviser. New Jersey Ceramic Research Station, Rutgers University, New Brunswick, N. J. Jun 1950. 8p Microfilm $1.25, Photostat $1.25. PB 105286
1. Steam boilers, Marine - Slag formation 2. Oil fuel - Analysis.

GAS TURBINE LOCOMOTIVE DEVELOPMENT, PART I, by D. C. MacPhail, R. A. Tyler, and J. Featonby. National Research Council of Canada. Division of Mechanical Engineering. Nov 1949. 22p drawings, graphs Microfilm $2.00, Photostat $3.75. PB 105696

A possible evolution of the gas-turbine locomotive from an arrangement in which the turbine-elements initially form merely a transmission for one or more Diesel engines is described. Consideration is given to the simple pneumatic drive involving a Diesel-driven compressor supplying one or more air turbines geared to the running wheels. An arrangement is described in which fuel is burned between the compressor and the final drive turbine. The conventional gas turbine is analyzed, and problems of cold-weather operation, transmission, and fuel to be used are discussed. Design point characteristics for primary, intermediate, and ultimate stages of various compound locomotive power plants are studied. A course of action is suggested by means of which the design and control problems of the gas turbine are reduced to manageable proportions and a large increase in the output of Diesel installations is attained at reasonable efficiency. NRCC MT 8.

GAUGING AND MEASURING SCREW THREADS. Gt. Brit. National Physical Laboratory. 1951. 121p photos, drawings, diagrs, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.25. PB 105674
1. Screw threads - Measurement - Gt. Brit. 2. Gages, Screw thread - Gt. Brit.
Notes on applied science, no. 1. S. O. Code no. 48-120.

GERMAN MACHINE TOOL INDUSTRY. British Intelligence Objectives Sub-Committee. n.d. 10f Microfilm $1.25, Enlargement Print $2.50. PB 105733
1. Tools, Machine - Manufacture - Germany 2. Engines, Diesel - Automotive - Germany 3. Pumps - Manufacture - Germany 4. BIOS FR 390 5. Micro BIOS FD 3043/48, Frames 1-10.

GERMAN MACHINE TOOL INDUSTRY, by B. K. Nelson. British Intelligence Objectives Sub-Committee. Jun 1946. 22f Microfilm $2.00, Enlargement Print $5.00. PB 105645
1. Tools, Machine - Germany 2. Lathes - Design - Germany 3. Düsseldorfer Eisenhutte Gesellschaft, Ratingen, Ger. 4. Rhöde & Döremberg, Oberkassel, Ger. 5. Schwemann, Carl, Erkrath, Ger. 6. Rich & Hoffhienz, Haan, Ger. 7. Köllmann Maschinenbau G.m.b.H., Laugonberg, Ger. 8. Kloppwerke, Sölingen, Ger. 9. Kölb, Hermann, Köln, Ger. 10. Fette, Wilhelm Hamburg, Ger. 11. Werkezeugmaschinen Alfred Erikson, Hannover, Ger. 12. Heidenreich & Harbeck, Hamburg, Ger. 13. Wohlenberg K. G., Hannover, Ger. 14. Löwe Werkezeugmaschinen A. G., Berlin 15. Boley, G., Esslingen, Ger. 16. Böhringer, Gebruder, G.m.b.H., Stuttgart, Ger. 17. BIOS FR 807 18. Micro BIOS FD 3070/48, Frames 1-22.

HIGH SURFACE FINISHING OF H.S.S. CUTTING TOOLS. U. S. Navy Dept. Office of Procurement and Material. Dec 1944. 2p photos Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.25. PB 105684
1. Tools, Cutting - Sharpening 2. NAVSHIPS IN 27.

INDUSTRIAL NOTES, GENERAL INFORMATION ON. U. S. Bureau of Ships. Jul 1948. 10p Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.25. PB 105706
1. NAVSHIPS IN 81.

JIGS AND FIXTURES, AIR OPERATED. U. S. Navy Dept. Office of Procurement and Material. Mar 1945. 4p photos, diagr Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.25. PB 105702
1. Tools, Pneumatic 2. Jigs 3. NAVSHIPS IN 35.

JIGS AND FIXTURES; DESIGN AND USE. U. S. Navy Dept. Office of Procurement and Material. Feb 1945. 6p drawings Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.25. PB 105701
1. Tools - Design 2. Jigs 3. NAVSHIPS IN 33.

LAMINAR FRICTION AND HEAT TRANSFER AT MACH NUMBERS FROM 1 TO 10, by E. B. Klunker and F. Edward McLean. U. S. National Advisory Committee for Aeronautics. Oct 1951, 22p graphs Microfilm $2.00, Photostat $3.75. PB 104950
1. Heat - Transference - Aerodynamics 2. Friction - Theory 3. Flow, Laminar 4. Mach number - Effect 5. U. S. Langley Aeronautical Laboratory, Langley Field, Va. 6. NACA TN 2499.

LIQUID NITRIDING OF HIGH SPEED STEEL CUTTING TOOLS. U. S. Navy Dept. Office of Procurement and Material. Dec 1944. 2p. Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.25. PB 105697
1. Tools, Cutting - Case hardening - Nitriding process 2. Case hardening - Nitriding process 3. NAVSHIPS IN 28.

METHODE ZUR BESTIMMUNG VON ZAHNFLANKENFEHLERN DURCH MESSUNG DER ZAHNVERFORMUNG IM EINGRIFF UND UNTER BETRIEBSLAET (METHOD OF DETERMINING TOOTH PROFILE ERRORS BY MEASURING THE TOOTH DEFORMATION WHEN IN MESH UNDER LOAD), by H. Lehnert. May 1950. 28p photos, drawings (part fold), graphs (part fold) Microfilm $2.00, Photostat $3.75. PB 105202

1. Gears - Teeth - Deformation - Germany 2. Germany. Physikalisch-Technische Reichsanstalt 3. DSIR SR 22.

Translation of Germany. Physikalisch-Technische Anstalt. Report 3.

NOTE ON A ROTATING BENDING-FATIGUE MACHINE FOR TESTS AT 200 DEG. C, by C. E. Phillips and R.C.A. Thurston. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Dec 1944. 4p photos, diagr, graph, table Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.35. PB 105781

1. Machines, Fatigue testing - Gt. Brit. 2. ARC RM 2674.

S. O. Code no. 23-2674. Cover date is 1951.

OXY-ACETYLENE WELDING AND CUTTING EQUIPMENT; CARE IN THE USE OF. U. S. Navy Dept. Office of Procurement and Material. Apr 1945. 4p Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.25. PB 105704

1. Welding, Oxyacetylene - Equipment 2. Tools, Cutting - Maintenance and repair 3. NAVSHIPS IN 38.

REPORT ON MACHINE FOR MAKING SPLIT RINGS FROM WIRE. British Intelligence Objectives Sub-Committee. B.I.O.S. trip no. 1890. Sep 1947. 10f photos, diagr Microfilm $1.25, Enlargement Print $2.50. PB 105717

1. Brauckmann & Probsting, Lundenschied, Ger. 2. Rings - Manufacture - Germany 3. Machines, Ring making - Germany 4. BIOS FR 1674 5. Micro BIOS FD 733/49, Frames 1-9.

Abstract included.

REPORT ON VISIT TO B.M.W. ESTABLISHMENT, MUNICH. British Intelligence Objectives Sub-Committee. B.I.O.S. trip 1402. n.d. 2f Microfilm $1.25, Enlargement Print $2.50. PB 105651

1. Automotive industry - Germany 2. Engines, Automotive - Germany 3. Bayerische Motoren Werke, Munich, Ger. 4. BIOS FR 963 5. Micro BIOS FD 3085/48, Frames 1-2.

SACK CHUTE MACHINERY. British Intelligence Objectives Sub-Committee. 1930. 15f drawings only (Legends in German) Microfilm $1.75, Enlargement Print $3.75. PB 105725

1. "Miag" Muhlenbau und Industrie A. G., Braunschweig, Ger. 2. Soaps - Manufacture - Machinery - Germany 3. Machinery - Design - Germany 4. BIOS FR 1258 5. Micro BIOS DOCS 2946/2003 6. Micro BIOS FD 1835/47, Frames 1-2.

Abstract included.

SCHLUPFMESSUNG AN REIBRÄDERN (MEASUREMENT OF SLIP IN FRICTION WHEELS), by Herr Bötz. Jul 1949. 5p diagrs, graphs Microfilm $1.25, Photostat $1.25. PB 105200

1. Bearings, Friction - Slip - Germany 2. Braunschweig. Technische Hochschule. Institut für Maschinenelemente 3. DSIR SR 19.

Translation of Institut für Maschinenelemente, Technische Hochschule, Braunschweig. Einzelbericht nr. 111.

SHOE AND TANNING MACHINERY INDUSTRY AND ASSOCIATED TRADES, REPORTED by G. C. Ralphs, C. H. Hargrave, H. W. Pochine, W. Rock, J. W. Whadcoat, L. Somervell. British Intelligence Objectives Sub-Committee. B.I.O.S. trip 1589. 1945. 56f Microfilm $2.75, Enlargement Print $8.75. PB 105657

1. Deutsche Vereinigte Schuhmaschinen B.m.b.H., Frankfort, Ger. 2. Albeko Schuhmaschinen G.m.b.H., Frankfort, Ger. 3. Salamander A. G., Stuttgart, Ger. 4. Fortuna Werke Spezialmaschinen-Fabrik A. G., Stuttgart, Ger. 5. Moenus A. G., Frankfort, Ger. 6. Schön & Cie., Schuhmaschinenfabriken, Pirmasens, Ger. 7. Schafer, Ferd., Söhne, Maschinenfabrik, Primasens, Ger. 8. Sandt, J., Schuhmaschinenfabrik, Primasens, Ger. 9. Paff, G.M., A. G., Kaiserlautern, Ger. 10. Hestika Spezialmaschinenfabrik (Karl Hees & Co.), Ludwigsburg, Ger. 11. Maier & Remshardt, Heilbron a/Neckar, Ger. 12. Winkle, Brüder, Altenstadt, Ger. 13. Medicus Shoe Co., Nuremberg, Ger. 14. Walther, H., & Co., K. G., Frankfurt am Main, Ger. 15. Klebstoffwerke Collodin, Frankfurt am Main, Ger. 16. Adrian & Busch, Oberursel, Ger. 17. Spang & Brands, Schuhmaschinenfabrik, Oberursel, Ger. 18. Maschinenfabrik Turner A. G., Oberursel, Ger. 19. Rowley & Kieser, Rodelheim, Ger. 20. Shoe machinery - Manufacture - Germany 21. Tanning machinery - Manufacture - Germany 22. BIOS FR 1175 23. Micro BIOS FD 3094/48, Frames 1-55.

B/TJ 170/404. Abstract included.

TAPS; USE, CARE AND MAINTENANCE. U. S. Navy Dept. Office of Procurement and Material. Nov 1944 4p drawings, table Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.25. PB 105709

1. Taps (Tool) - Maintenance and repair 2. NAVSHIPS IN 26.

MEDICAL RESEARCH AND PRACTICE

ACTIVITIES OF THE CARDIOVASCULAR SYSTEM DURING HYPOXIA, II: SIMULTANEOUS RECORDING OF PULSE CONTOURS ON CENTRAL AND PERIPHERAL ARTERIES WITH A MECHANO-ELECTRONIC TRANSDUCER, by Hans-Georg Clamann. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Aug 1951. 6p photos, diagrs Microfilm $1.25, Photostat $1.25. PB 105627

A device for converting the mechanical energy of the pulse wave directly into changes in electric current is explained and an arrangement for the simultaneous recording of pulse waves from central and peripheral arteries described. The advantages of the new de-

vice are: (1) The high natural frequency of the mechano-electronic transducer employed insures accurate reproduction of each pulse wave pattern. (2) Electrical transmission allows remote recording and greater freedom of movement compared with the air transmission sphygmograph. (3) The recordings are not affected by changes in barometric pressure nor by extremes of temperature. AAF SAM Proj. 21-23-013, Report no. 2.

APPLICATION OF SCIENTIFIC METHODS TO INDUSTRIAL AND SERVICE MEDICINE (PROCEEDINGS OF A CONFERENCE HELD FROM MARCH 29TH TO MARCH 31ST, 1950). Gt. Brit. Medical Research Council. 1951. 110p maps, drawings, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.75. PB 105166

1. Medical science - Gt. Brit. 2. Medical service, Industrial - Gt. Brit. 3. Medicine, Military - Gt. Brit. 4. Berylliesis - Gt. Brit. 5. Chemical compounds, Organic - Toxicity - Gt. Brit. 6. Dyspnea - Gt. Brit. 7. Fluoresis - Gt. Brit. 8. Heat - Physiological effects - Gt. Brit. 9. Machinery - Design - Anatomical factors - Gt. Brit. 10. Peptic ulcer - Gt. Brit. 11. Pneumoconiosis - Gt. Brit. 12. Tuberculosis, Pulmonary - Gt. Brit.

Contents: Opening address, by H. P. Himsworth. - General principles of field surveys, by A. Bradford Hill. - Survey of sickness incidence by D. D. Reid. - Occupational factors in peptic ulcer, by Richard Doll. - Medical field surveys in industry and the services in relation to laboratory research by J. R. Squire. - Occupational and domiciliary factors in pulmonary tuberculosis, by Alice Stewart. - Fluorosis and berylliosis as industrial and community health hazards, by Donald Hunter. - Use of experimental pathological techniques in assessing the toxicity of chemical compounds, by J. M. Barnes. - Effects of warmth on comfort and efficiency, by T. Bedford. - Physiological studies of the effects of heat, by J. S. Weiner. - Anatomoical factors in machine design, by H. D. Darcus. - Laboratory analysis of human activities, by F. C. Bartlett. - Some problems in the investigation of coal workers pneumoconiosis, by C. M. Fletcher. - Methods of investigating the connection between dust and disease, by A. L. Cochrane. - Problems in the physiological assessment of shortness of breath, by J. C. Gilson.

BACKGROUND INFORMATION ON COBALT 60 TELETHERAPY UNITS, by A. Morrison. National Research Council of Canada. Division of Physics. Radiology Laboratory. Aug 1951. 13p Available from National Research Council of Canada, Ottawa, Canada. $.15. PB 105056

1. Cobalt, Radioactive - Therapeutic use - Canada 2. Atomic power - Research - Canada 3. Teletherapy - Canada 4. NRCC 2496.

Divisional report no. PR-113.

BLOOD VOLUME IN THE DOG DURING ALTITUDE ACCLIMATIZATION, by Kurt R. Reissmann. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Jul 1951. 9p graphs, tables Microfilm $1.25, Photostat $1.25. PB 105470

Plasma, cell, and blood volume, and total circulating hemoglobin were studied in a group of dogs before, during, and after acclimatization to 20,000 feet altitude During altitude exposure, the plasma volume decreased gradually to a constant level which was 75 percent of ground-level value. The cell volume reached a plateau of 170 percent of the ground-level value in the 5th week of exposure and returned to normal within 5 weeks after exposure had been discontinued. The total circulating hemoglobin paralleled the cell volume; in some animals more than 200 gm. hemoglobin were synthesized during 5 weeks of exposure. The total blood volume remained almost constant in the first 2 weeks of exposure, then increased slowly and reached a plateau of 125 percent of the ground-level value in the 5th week of exposure. AAF SAM Proj. 21-23-003, Report no. 1.

CAUSE OF THE INCREASING INTRAVENOUS TOXICITY OF 90% HYDROGEN PEROXIDE WITH PROGRESSIVE DILUTIONS, by M. Caroline Hrubetz, Lillian W. Conn, Hyman R. Gittes, James K. MacNamee, Jacqueline Hull Williams. U. S. Chemical Corps. Medical Laboratories, Army Chemical Center, Md. Aug 1951. 14p photos, graph, tables Microfilm $1.75, Photostat $2.50. PB 105604

1. Hydrogen peroxide - Toxicity 2. Embolism, Gas - Physiological effects 3. CC MD RR75.

Project no. 4-61-14-002.

COMPARATIVE EVALUATION OF THE NEW LONDON NAVY LANTERN FOR TESTING COLOR PERCEPTION, by Ingeborg Schmidt. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Aug 1951. 12p graph, tables Microfilm $1.75, Photostat $2.50. PB 105625

The results of New London Navy Lantern tests on 435 normals and 65 color defectives did not correlate closely with results of other tests. It did not screen with precision those failing the flare test. The colors were memorized by some color defectives. Its test-retest reliability proved satisfactory. Results of two samples of lantern were similar. The test in its present state cannot be used as simple pass-or-fail test according to number of errors. Types of errors should be used as additional criteria in scoring. The lantern is not a satisfactory replacement for color vision tests now in use, because it disqualifies some normals and also subjects who, even though moderately defective in color vision, can perform the duties of airmen. The signal colors in Navy Lantern could be improved. AAF SAM Proj. 21-29-009.

CYCTOCHROME C OXIDASE OF THE HOUSE FLY, MUSCA DOMESTICA L., by Bertram Scakter. U. S. Chemical Corps. Medical Laboratories, Army Chemical Center, Md. Jul 1951. 16p graphs Microfilm $1.75, Photostat $2.50. PB 105507

1. Cytochrome C, Radioactive - Metabplism 2. Oxidase, Cytochrome 3. Musca domestica - Cytochrome system 4. CC MD RR69.

DISCRIMINATORY ANALYSIS: VI: ON THE SIMULTANEOUS CLASSIFICATION OF SEVERAL INDIVIDUALS, by E. L. Lehman, U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Aug 1951. 27p Microfilm $2.00, Photostat $3.75. PB 105465

The classification of individuals is considered, and for some simple problems minimax procedures are obtained. Other procedures are given which are minimax and admissible in the limit as the number of individuals become larger. Project number 21-49-004, Report number 6.

DISCRIMINATORY ANALYSIS. VII: ON THE THEORY OF SELECTION, by E. L. Lehmann. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Aug 1951. 10p Microfilm $1.25, Photostat $1.25. PB 105624

A study is made of the problem of classifying each of s populations as good or bad. What constitutes a good or bad population is defined not in absolute terms but in terms of the quality of the populations at hand. AAF SAM Proj. 21-49-004, Report no. 7.

EFFECT OF STRESS ASSOCIATED WITH FLIGHT ON THE CARDIOVASCULAR-RENAL LESIONS PRODUCED BY HYPERSENSITIVE REACTIONS, 1: CARDIOVASCULAR-RENAL LESIONS IN HYPERSENSITIVE ANIMALS EXPOSED TO ACUTE ALTITUDE STRESS, BY ROLAND B. MITCHELL, RALPH M. THOMPSON, AND ANNA C. ARNOLD, WITH THE TECHNICAL ASSISTANCE OF CORPORAL Franklin T. Elkins. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Jul 1951. 33p photos, graph, tables Microfilm $2.00, Photostat $3.75. PB 105533

The results of a study on the effects of intermittent exposure to high altitude on the cardiovascular-renal lesions in hypersensitive animals are described. Sixty rabbits provided four treatment combinations: controls; hypersensitivity to horse serum; acute exposure to high altitude; and a combination of the hypersensitive state and altitude exposure. Qualitative and quantitative estimates of the pathologic lesions were made at the end of 28 days for the four groups of experimental animals. Under the conditions of this study the pathologic evaluation of the animals showed that the protracted hypersensitive state when combined with the stress of altitude exposure resulted in a greater degree of heart and kidney damage than did either hypersensitivity or altitude stress alone. AAF SAM Proj. 21-32-020, Report no. 1.

FAULTY DEPTH PERCEPTION CAUSED BY CYCLOTORSION OF THE EYES, by Paul A. Cibis and Max Halperin. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Sep 1951. 12p diagr, graphs, tables Microfilm $1.75, Photostat $2.50. PB 105183

One hundred subjects were examined for cyclotorsion in two different tests. Seventy gave evidence of marked cyclotorsion significant on a 5 percent probability level when the illumination or state of adaptation was changed. The investigation revealed, furthermore, that cyclofusional compulsions during bright adaptation continued, although gradually attenuating, up to 15 minutes during the period of dark adaptation. The effect of general oxygen deficiency and alcoholic intoxication on cyclotorsion was studied in a limited number of subjects. AAF SAM Proj. 21-24-013, Report no. 1.

GASEOUS NITROGEN ELIMINATION: EXPERIMENTS WHEN BREATHING OXYGEN AT REST AND AT WORK, WITH COMMENTS ON DYSBARISM, by Walter M. Boothby, Ulrich C. Luft, Otis O. Benson, Jr. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Aug 1951. 35p photos, graphs, tables Microfilm $2.25, Photostat $5.00. PB 105466

Recent experiments indicate that the "starting time" of tissue nitrogen elimination can be determined nearly as accurately as the complete washout of pulmonary nitrogen. Previous experiments had shown that accumulated gaseous tissue nitrogen elimination, when washed out by breathing oxygen for 150 minutes both at sitting rest and at work, would plot on a straight line on log-log paper. In subsequent experiments the time was increased to 5 or 6 hours at sitting rest. This log-log plot is of value (1) in calculating the time required to lower, below one half the average pressure of gaseous tissue nitrogen in the body, and thus to reduce the danger from bends in airscrews at high altitudes; (2) in interpolating values on a straight line at 0.5 and 1.0 minute, and thus calculating the circulation rate. Project numbers 21-53-003, Report number 1.

INFLUENCE OF POLYTHEMIA PRODUCED AT HIGH ALTITUDE ON RESISTANCE TO INFECTION, IV: THE RESPONSE TO DIPLOCOCCUS PNEUMONIAE INFECTION, BY L. JOE BERRY AND ROLAND B. MITCHELL, WITH THE TECHNICAL ASSISTANCE OF Elenore Schewe and Elizabeth Travaglini. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Nov 1951. 5p graphs, tables Microfilm $1.25, Photostat $1.25. PB 105622

1. Polycythemia, Induced 2. Mice - Polycythemia, Induced 3. Infections, Experimental 4. Diplococcus pneumoniae 5. Oxygen deficiency - Physiological effects 6. Altitude, High - Physiological effects 7. Bryn Mawr College. Dept. of Biology, Bryn Mawr, Pa. 8. AAF SAM Proj. 21-35-005, Report no. 4. Contract number AF 33 (038)-17842.

MOTION AND PERCEPTION OF SPACE, by Hans Hartinger. Aug 1951. 24p diagrs Microfilm $2.00, Photostat $3.75. PB 105628

The influence of the delay in perception caused by the so-called perception time on the interpretation of space, on the perceived movements of objects, and on the perceived distortions of shapes is studied in this paper. Differences in perception time between the eyes of an observer can be caused by physiological factors like retinal malfunctions and change in pupillary diameter, as well as physical factors such as difference in transmission of sun goggles. It is shown that speeds occurring in motoring and flying cause effects of considerable importance. Formulas for the effects are derived and an example of the computation is given. Translated from the German by Miss Hildegard Weiss, USAF School of Aviation Medicine. AAF SAM Proj. Special report.

PHYSIOLOGICAL RELATIONSHIPS IN HUMAN STRESS RESPONSE: I: EOSINOPHIL RESPONSE TO MUSCULAR ACTIVITY, by Thaddeus J. Domanski,

TECHNICAL REPORTS News letter

PUBLISHED MONTHLY

U. S. DEPARTMENT OF COMMERCE
OFFICE OF TECHNICAL SERVICES
WASHINGTON 25, D. C.

NO. 32 FEBRUARY, 1952

Productivity Aids for the FOUNDRY INDUSTRY

NEW CASTING PROCESS. The new "Croning" or "C" process for casting metals, which uses a thin walled (shell) mold produced by mixing dry sand and a plastic bonding agent, produces castings which are more accurate and have better finish than those produced by the earlier sand mold process. Also the new process is faster, cheaper, requires fewer man hours and less use of skilled labor. For full particulars on utilizing this process according to procedure developed by the Navy, order PB 105131 Mimeo 25¢.

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PRODUCTIVITY SURVEY - BRASS FOUNDRIES. In its report on a survey of the U. S. Brass foundry industry, a British productivity team highlights the management and production practices that contribute most to our higher productivity. Packed with productivity-improvement ideas are this book-length report's especially good chapters on Costing; Time and Motion Study; Foundry Lay-out, Aids and Mechanization; Technical Control; and Machining. Request (8A).

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FLASH WELDING OF HIGH-TENSILE STEELS

A British research report indicates the effects of different factors - flashing distance, upset distances, flashing speed, and secondary voltages - on the quality of flashwelded joints in high-tensile-steel airframes. Order PB 104571 Microfilm $2.00, Photostat $3.75.

THE NEWSLETTER is a monthly digest of outstanding technical reports available to business firms and laboratories from Federal and other nonconfidential research sources. Special emphasis is placed upon items of interest to smaller business firms. The Newsletter may be purchased as part of the Bibliography of Technical Reports (subscription price, $5 per year) or separately (50c per year).

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HEAT PUMPS. The process used in mechanical refrigeration systems can be reversed and utilized to warm up a space instead of cooling it. Systems which can be switched from one function to the other (from heating to cooling and vice versa) are called heat pumps. The present state of development in heat pumps plants, the major types in use, and some underlying considerations in their design are briefly reviewed in an OTS report. A good bibliography is included. Order PB 105425 Mimeo 50¢.

DRY CLEANING SOLVENTS. To obtain a safer dry cleaning solvent, the Stoddard class of petroleum distillates was developed and has come into universal use. An OTS report summarizes the properties of this fluid as a dry cleaning solvent, the standards for its sale as a commercial product and the precautions against skin damage required in using it. Order PB 105315 Mimeo 25¢.

VINEGAR TECHNOLOGY. The entire technology of vinegar is reviewed in detail in a 67-page Canadian National Research Council Report No. 17 which treats extensively: Raw Materials; Conversion of Sugars to Alcohol; Conversion of Alcohol to Acetic Acid; Finishing Vinegar; Vinegar Generators; Installation of Vinegar Generators; Spoilage in the Vinegar Factory; Corrosion by Vinegar; and Process Control. The report includes an extensive bibliography. Request (8C).

INDUSTRIAL SAFETY. Illustrated descriptions of industrial accidents and the recommendations given for preventing their recurrences are contained in quarterly reports. "Accidents, How They Happen and How to Prevent Them". Order from the British Information Services, 30 Rockefeller Plaza, N. Y. 20, N. Y. Price: 25¢.

For the Shop

LUBRICATION - Pointers for adjusting your plant's lubrication program to meet the needs of heavy defense production are given in a Defense Production Aid (No. 16) on "Lubrication of Machine Tools". Request (8D).

TOOL CONSERVATION - Essential details to consider in planning or improving your conservation program for scarce machine shop tools are set forth in a new Commerce Department Defense Production Aid (No. 19) entitled "Tool Conservation in Machine Shops". Includes salvaging of tool bits. Request (8E).

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For a comprehensive review of processes for producing ceramic-film coatings see the report on "The Formation of Refractory Coatings by Vapor-Deposition Methods" (PB 104288 Mimeo $2.75), which is briefly summarized in the November, 1951 Technical Reports Newsletter.

"NATURAL" BUILDING VENTILATION

How to design homes or public industrial buildings to provide the best natural ventilation, particularly in warm climates, is extensively discussed in the Texas Engineering Experiment Station report on "Some General Considerations in the Natural Ventilation of Buildings". Major subjects are: the physical fundamentals of air movement around and through buildings; principles of design to get best ventilation; and methods of checking the design by test models. Limited number of copies available free. Order by title from the Texas Engineering Experiment Station, College Station, Texas.

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TOWARDS METALLIC SILICON

In a search to obtain silicon in ductile form to permit its use as a metal, major steps in increasing our scientific knowledge of the characteristics and properties of this element have been made. These are:

PURE SILICON. A research report on work done for the Air Force by Armour Research Foundation gives a literature survey on the properties of experimental laboratory produced melts of high purity metallic silicon. Also describes experimental work which resulted in a successful method for obtaining melts (ingots) of pure silicon by utilizing the hydrogen welding technique. Order PB 104436 Microfilm $2.50, Photostat $6.25.

SILICON ALLOYS. A report on the continuation of Armour Research Foundations work for the Air Force describes the silicon-rich alloys systems with vanadium, chromium, manganese, nickel and molybdenum. Report also describes (1) a successful tungsten-electrode are furnace method of producing the alloys; (2) and induction heated hot hardness tester to evaluate the properties of the silicon base alloys at high temperatures. Order PB 104438 Microfilm $2.25, Photostat $5.00.

GOOD SPEECH PRACTICE -- for INDUSTRY

Of value to those industries where correct interpretation of spoken messages is vital, is the report of a psychological research study on what factors affect the intelligibility of speech. The study was done by the Psycho-Acoustic Laboratory of Harvard University for the Office of Naval Research. One of the factors investigated was the repetition of vocal communications. The results indicate that far more improvement in communications is possible by standardizing procedures and vocabulary than by merely repeating all messages one or two times. Order PB 105285 Microfilm $2.00, Photostat $3.75.

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Algernon G. Swan, J. Gordon Wells, and Lora Belle Hughes. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Oct 1951. 14p graphs Microfilm $1.75, Photostat $2.50. PB 105467

The eosinophil profile is introduced as a helpful device for the recognition and the representation of an eosinophil response related to submaximal stress. Eosinophil response patterns associated with selected forms of treadmill exercise, are presented and discussed. The exercise employed emerges as a relatively uncomplicated form of stress. Such stress, of itself, probably does not provoke a major emotional response. Project number 21-32-025, Report number 1.

PROPAGATION OF SURFACE WAVES OVER THE HUMAN BODY, by Ernst K. Franke, Henning E. von Gierke, Hans L. Oestreicher, Wolf W. von Wittern. U. S. Air Development Force. Research Division. Aero Medical Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio. Jun 1951. 17p photos, graphs Microfilm $1.75, Photostat $2.50. PB 105629

Waves propagating over the surface of the human body are theoretically and experimentally investigated. They are photographed by means of synchronized stroboscopic light and their propagation velocity and amplitude determined by an accurate electrical measuring method. The comparison of the measured values with the results of the theoretical analysis allows the determination of the coefficient of elasticity of human tissue. AAF TR 6464.

REPORT ON THE STATE OF TAXONOMIC BOTANY AND BOTANICAL COLLECTIONS IN SOME AREAS OF GERMANY SINCE 1939, REPORTED by A. H. G. Alston. British Intelligence Objectives Sub-Committee. BIOS Trip 2681. Nov 1946. 190p Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $4.15. PB 105310

1. Botany, Taxonomic - Germany 2. BIOS FR 1520. S. O. Code no. 51-5275-20.

STUDIES OF UNDERNUTRITION, WUPPERTAL 1946-9, BY MEMBERS OF THE DEPARTMENT OF EXPERIMENTAL MEDICINE, CAMBRIDGE, AND ASSOCIATED WORKERS. Gt. Brit. Medical Research Council. 1951. 448p graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $2.85. PB 105329

1. Malnutrition - Germany 2. Emotional stability - Effects of malnutrition - Germany 3. Cold - Exposure - Vasamotor response - Germany 4. Water - Metabolism - Germany 5. Blood - Cholineste rose - Germany 6. Blood - Sedimentation - Rates - Germany 7. Blood - Cholinesterase - Germany 8. Blood - Prothrombin - Germany 9. Blood - Protein - Germany 10. Blood pressure, High - Effect of postural changes - Germany 11. Blood pressure, High - Pulse rate - Germany 12. Bones - Roentgenography - Germany 13. Nitrogen - Absorption - Germany 14. Nitrogen - Excretion - Germany 15. Calcium - Absorption - Germany 16. Calcium - Excretion - Germany 17. Magnesium - Absorption - Germany 18. Magnesium - Excretion - Germany 19. Phosphorus - Absorption - Germany 20. Phosphorus - Excretion - Germany 21. Childbirth - Effect of malnutrition - Germany 22. Milk, Human - Composition - Germany 23. Urine, Diastase 24. MRC SR 275.

Medical Research Council, Special report series no. 275. S. O. Code 45-8-75*. Contents: I. The German Background, by R. A. McCance and E. M. Widdowson. - Part II. History, significance and aetiology of hunger oedema, by R. A. McCance. - III. Effect of undernutrition on the skin, by R. A. McCance and A. M. Barrett. - IV. Radiological observations on the alimentary tract, by F. R. Berridge. - V. Hepatic structure and function, by Shelia Sherlock and Veryan M. Walshe. - VI. Enlargement of the parotid glands, by R. A. McCance and R. F. A. Dean, and A. M. Barrett. - VII. Neuromuscular system: Tendon reflexes and valvanic responses, by R. A. McCance and R.F.A. Dean. - VIII. Emotional disturbances and behavioural reactions, by D. Russell Davis. - IX. Effect of undernutrition and of posture on the volume and composition of the body fluids, by E. M. Widdowson and R. A. McCance. - X. Aspects of renal function and water metabolism, by R. A. McCance. - IX. Serological responses to antigenic stimuli, by P. G. H. Gell. - XII. Osmotic pressure of the serum proteins, by R. A. McCance and E. M. Widdowson. - XIII. Electrophoretic analysis of sera, by R. A. Kekwick. - XIV. Ratio of arginine to lysine in the serum proteins, by P. E. H. Jones. - XV. Serum cholinesterases, by Audrey O. Hutchison, R. A. McCance and E. M. Widdowson. - XVI. Enzyme activities of the red blood cells, by Audrey O. Hutchinson. - XVII. Sedimentation rates, by Lois A. Thrussel and R. A. McCance. - XVIII. Prothrombin times, by M. D. Newman and P. R. V. Tomson. - XIX. Excretion of diastase in the urine of undernourished persons, by E. M. Glaser. - XX. Cardiac output and the peripheral circulation, by Sheila Howarth. - XXI. Radiological observations on the size of the heart, by F. R. Berridge. - XXII. Vasomotor responses to local cold, by M. D. Newman and P. R. V. Tomson. - XXIII. Capillary resistance and permeability, by R. A. McCance and Lois A. Thrussell. - XXIV. Response of the blood pressure and pulse rate to postural changes and exercise, by E. M. Glaser. - XXV. Radiological observations on the bones, by F. R. Berridge and Kathleen M. Prior. - XXVI. Absorption and excretion of nitrogen, calcium, magnesium and phosphorus, by E. M. Widdowson and Lois A. Thrussell. - XXVII. Response to unlimited food, by E. M. Widdowson. XXVIII. Size of the baby at birth and the yield of breast milk, by R. F. A. Dean. - XXIX. Volume and composition of human milk, by Mavis Gunther and Jean E. Stanier. - Appendix: Laboratory techniques.

SEMI-ANNUAL TECHNICAL PROGRESS REPORT 30 JUNE 1951: AERO MEDICAL SUBCOMMITTEE, AERO MEDICAL LABORATORY SUPPLEMENT, VOL. II. CASE NO. 5-3, REPORT NO. 4. U. S. Air Force. Technical Committee, Wright-Patterson Air Force Base, Dayton, Ohio. Jun 1951. 76p Microfilm $3.50, Photostat $10.00. PB 105270

1. Medicine, Aviation - Research 2. U. S. Air Materiel Command. Engineering Division. Aero-Medical Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio.

Report on projects of the Aero-Medical Laboratory. Reports control symbol DDRDB-3. For report no. 3, see PB 103349.

UNIVERSITY OF MICHIGAN LIBRARIES

SEMI-ANNUAL TECHNICAL PROGRESS REPORT, 30 JUNE 1951: AERO MEDICAL SUBCOMMITTEE, USAF SCHOOL OF AVIATION MEDICINE & ARCTIC AEROMEDICAL LABORATORY SUPPLEMENT, VOL. II. CASE NO. 5-3, REPORT NO. 4. U. S. Air Force. Technical Committee, Wright-Patterson Air Force Base, Dayton, Ohio. Jun 1951. 300p Microfilm $9.00, Photostat $37.50. PB 105271

1. Medicine, Aviation - Research 2. U. S. Air Force. Arctic Aeromedical Laboratory, Ladd Air Force Base, Alaska 3. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas.

Report on projects of the Arctic Aeromedical Laboratory and on projects of the School of Aviation Medicine. Reports control symbol DDRDB-3. For report no. 3 see PB 103350.

VISUAL PROBLEMS OF PILOT IN PRONE POSITION, by H. W. Rose, and Paul H. Ripple. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Aug 1951. 9p photos, tables Microfilm $1.25, Photostat $1.25. PB 105626

Visual problems imposed by the prone position in flight were investigated. Test persons were subjected to elevated gaze in a prone-position bed. Determination was made of their muscle balance, their ability to maintain elevated binocular gaze, and the lateral limits of their binocular vision during elevated gaze. During elevated gaze of 15 to 30 degrees, all the subjects experienced discomfort. With elevation of 20 degrees or more, the discomfort was serious, probably to the point that the subject could not perform with precision intricate tasks such as piloting aircraft. AAF SAM Proj. 21-24-011, Report no. 1.

METALS AND METAL PRODUCTS

ABSTRACTS OF RESEARCH REPORTS ON METALLURGICAL SUBJECTS, V. 4: WELDING TECHNOLOGY AND STRUCTURAL STEELS. Krupp, Friedrich A. G., Versuchsanstalt, Essen, Ger. 1936-1943. 117f (Text in German) Microfilm $4.75, Enlargement Print $16.25. PB 105635

1. Metallurgical processes - Germany 2. Metals - Research - Germany 3. Metals - Welding - Germany 4. Steel, Structural - Research - Germany 5. Welding - Research - Germany 6. Micro BIOS FD 1318/47, Frames 1-119.

English abstract included. Vols. 1-3 issued as Micro BIOS FD 1315/47-1317/47; abstracts for 1929-1936 are FD 1322/47-1323/47 (PB 90370).

ACCELERATED WEATHERING OF FILMS OF SEVERAL TYPE ORGANIC COATINGS ON SEVERAL METAL SUBSTRACTA, by B. G. Brand, E. R. Mueller, E. E. McSweeney. Battelle Memorial Institute, Columbus, Ohio. Jan 1949. 22p graphs, tables Microfilm $2.00, Photostat $3.75. PB 105567

The accelerated weathering of 4 representative types of unpigmented air-drying organic coatings on 4 different metal substrata, both naphtha degreased and chemically pretreated, was carried out in a National Carbon Company's Type X-1A Accelerated Weathering Unit, using the recommended cycle. Duplicate panels were run which produced results in very close agreement in almost all instances. The 4 coatings exhibited essentially the following order of merit: (1) phenolic varnish, specification 52-V-17, (2) alkyd spar varnish, specification AN-TT-V-116, (3) cellulose nitrate lacquer, specification AN-L-29, and (4) 2 vinyl chloride-acetate-type lacquers, no specification. Twelve week's aging before subjecting to weathering generally resulted in longer film life than did 7-day aging. The metals and surfaces studied were: (1) wire-brushed steel, (2) acid-etched steel, (3) Al, (4) phosphated Al, (5) FS-1A Mg, (6) chromated FS-1A Mg, (7) MA Mg, and (8) chromated MA Mg. The chromate-treated Mg metal, particularly FS-1A gave generally the best results with almost all of the coatings tested. This was especially true with the vinyl-type materials. Phosphate treating of Al and chromate treating of the Mg alloys increase film life. Acid pickling of steel decreases film life. Generally, subsurface rusting was encountered; this emphasizes the need for pretreating (phosphating generally recommended) and using rust-inhibitive primers for this metal. The tendency for the vinyl-type coatings to darken excessively on steel was noted in this study; this is generally attributed to the catalytic effect of iron on the dehydrochlorination of vinyl chloride. Contract no. N5-ori-111, Task order IV.

ANALYSIS OF DEGASSING 90 ALUMINUM - 10 MAGNESIUM ALLOY, by O. T. Pfefferkorn and W. O. Wetmore. U. S. Naval Ordnance Test Station, Inyokern, Calif. Jun 1949. 32p photos, diagrs, graphs, tables Microfilm $2.25, Photostat $5.00. PB 105740

The efficacy of various methods for degassing 90 aluminum-10 magnesium alloys with gaseous fluxes was determined in preliminary tests, the reduction or elimination of gas in the molten metal prior to casting being one major problem in the founding of aluminum alloys. Hydrogen is the injurous gas in aluminum or its alloys, forming pinholes and irregular intergranular cavities as the results of decreased solubility during solidification. The evolution of hydrogen in the form of gas bubbles starts as soon as the alloy is molten. Test results indicated that a definite outgassing period, as noted after gas fluxing, is required to remove the gas within the melt. The use of "Cavitation" degassing of metal, which has been gassed previously by steaming, resulted in densities of 2.56 plus thus indicating a very high degree of gas removal. Investigation was initiated under local project 274 and was continued on Task Assignment NOTS-19-Re3e-516-1. NAVORD 1162. NOTS 218.

BEHAVIOR OF METAL UNDER HIGH AND RAPIDLY APPLIED STRESSES OF SHORT DURATION, by John S. Rinehart. U. S. Naval Ordnance Test Station, Inyokern, Calif. Sep 1949. 20p photos, diagr, graph Microfilm $1.75, Photostat $2.50. PB 105741

Some of the effects produced by detonating explosive charges in intimate contact with metal plates, rods, and tubes, resulting in high and rapidly applied stresses, are described. The principal observable effects are the fracturing of the metal due to a tensional stress produced as the result of the reflection of a high compressional stress wave at a free boundary, the fracturing of the metal due to high hydrostatic pressure resulting from extremely rapid compression of the metal, and a simple low-order permanent strain

similar to that observed in slow compression tests. Further work is to be conducted on the study of these effects; the need for theoretical studies along these lines is indicated. NAVORD 1183. NOTS 239.

BEZIEHUNGEN ZWISCHEN DEM ELASTIZITATS-MODUL VON ZWEISTOFFLEGIERUNGEN UND IHREM AUFBAU (RELATIONS BETWEEN THE MODULUS OF ELASTICITY OF BINARY ALLOYS AND THEIR STRUCTURE), by Werner Köster and Walter Rauscher. Nov 1951. 49p graphs Microfilm $2.50, Photostat $6.25. PB 105818

A comprehensive survey of the elastic modulus of binary alloys as a function of the concentration is presented. Alloys that form continuous solid solutions, limited solid solutions, eutectic alloys, and alloys with intermetallic phases are investigated. Systems having the most important structures have been examined to obtain criteria for the relation between lattice structure, type of binding, and elastic behavior. Translated from Zeitschrift für metallkunde, Bd. 39, 1948, p. 11-120. Dissertation-Technische Hochschule, Stuttgart, 1942. NACA TM 1321.

CREEP TESTS ON SOME CAST MAGNESIUM ALLOYS, PARTS I-III, by A. E. Johnson, J. H. Tapsell and H. D. Conway. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Dec 1944. 22p graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.70. PB 105226

1. Magnesium alloys - Creep tests - Gt. Brit. 2. Magnesium alloys - Heat treatment - Gt. Brit. 3. ARC RM 2675.

Cover date is 1951. S. O. Code no. 26-2675. Part I: Creep tests of 150 hours duration at 100 deg., 150 deg. and 200 deg. C. on cast magnesium alloys, p. 1-5. - Part II: Comparison of the creep properties of three cast magnesium alloys based on tests of 1,000 hours duration, p. 6-16. - Part III: Effect of various heat treatments on the short-time creep behaviour at 3 ton/sq. in., 150 deg. C., of four cast magnesium alloys, p. 17-22.

EFFECT OF ALLOYING ELEMENTS ON IMPACT PROPERTIES OF QUENCHED AND TEMPERED STEELS, BY M. BAEYERTZ, W. F. CRAIG, JR. AND J. P. SHEEHAN. CONDUCTED AS PROJECT NO. 90-466B FOR OFFICE OF NAVAL RESEARCH UNDER CONTRACT N6ONR-274, T.O.I, PROJECT NR031-115. Armour Research Foundation, Chicago, Ill. Sep 1949. 318p photos, graphs, tables Microfilm $9.00, Photostat $39.00. PB 105049

1. Steel - Brittleness 2. Steel - Impact properties 3. Steel alloys - Brittleness 4. Martensite - Impact tests 5. ARF project 90-466B.

EFFECT OF SHORT TIMES AT ELEVATED TEMPERATURES ON SOME PROPERTIES OF 14S-T6 ALUMINUM ALLOY, by L. J. Maguire and W. O. Wetmore. U. S. Naval Ordnance Test Station, Inyokern, Calif. Aug 1949. 19p photos (1 fold), graphs, tables Microfilm $1.75, Photostat $2.50. PB 105739

In connection with the development of heat-resistant metals for use on artillery rocket compounds, an investigation was made to determine the effects of exposure of 14S-T6 aluminum alloy to elevated temperatures for short periods. In the firing of artillery rockets, heat is applied to the metal components for only 1 or 2 sec, but this period causes changes in microstructure and hardness of the components. It was found that exposure of parts made of 14S-T6 alloy to temperatures above 500°F for just a few seconds, materially lowers the properties and makes such parts unfit for high-strength service. The higher the exposure temperature, the greater is the loss in hardness and the greater the amount of precipitate. The data permit qualitative estimates of the extent and degree to which rocket components have been heated during firing. Investigation was conducted as part of Task Assignment. NOTS-19-Re3e-516-1. NAVORD 1176. NOTS 232.

EIGENSCHAFTEN VON STÄHLEN MIT CHROMGEHALTEN BIS ZU 5% (PROPERTIES OF STEELS CONTAINING UP TO 5% CHROMIUM), by Heinrich Cornelius. Deutsche Versuchsanstalt für Luftfahrt, E. V. Institut für Werkstoff Forschung. May 1942. 64f photos, graphs, tables (Text in German) Microfilm $3.00, Enlargement Print $10.00. PB 105433

1. Steel, Chromium - Brittleness - Germany 2. Steel, Chromium - Hardness tests - Germany 3. Steel, Chromium - Hardness tests - Germany 4. Steel, Chromium - Heat treatment - Germany 5. Steel, Chromium - Notched bar tests - Germany 6. Steel, Chromium - Structure - Germany 7. Micro BIOS FD 948/49, Frames 1-59.

English abstract included.

FLEXURAL FATIGUE STRENGTHS OF RIVETED BOX BEAMS - ALCLAD 14S-T6, ALCLAD 75S-T6, AND VARIOUS TEMPERS OF ALCLAD 24S, by I. D. Eaton and Marshall Holt. U. S. National Advisory Committee for Aeronautics. Nov 1951. 25p photos, diagrs, graphs Microfilm $2.00, Photostat $3.75. PB 105710

Results are given of tests made to determine and compare the flexural fatigue strengths of built-up riveted box beams made from 14S-T6, 75S-T6, and various tempers of 24S alclad aluminum-alloy sheet. NACA TN 2452.

HARD METAL FROM ALUMINUM BRONZE POWDER AND BORIC ACID ANHYDRIDE AS A SUBSTITUTE FOR BORON CARBIDE, by Karl Forch. n.d. 4f (Text in German) Microfilm $1.25, Enlargement Print $1.50. PB 105437

1. Boron carbide - Substitutes - Germany 2. Alboran (Trade name) 3. Aluminum powders - Uses - Germany 4. Micro BIOS FD 3028/49, Frames 1-3.

Short summary and abstract in English included. Abstract available as PB 105437s. 1p. Microfilm $1.25, Photostat $1.25.

INTERROGATION OF DR. JEAN MAEDER OF LEIPZIGER LEICHT-METALLWERKE, A. G., RAGWITZ, ON WELDING TESTING, AND PROPERTIES OF CERTAIN METALS, by E. W. Harding and T. J. Peake. Gt. Brit. Ministry of Supply. Feb 1946. 12f Microfilm $1.75, Enlargement Print $3.75. PB 105436

1. Aluminum alloys - Physical properties - Germany

2. Aluminum alloys - Silicon determination - Germany 3. Aluminum alloys - Tests - Germany 4. Aluminum alloys - Soldering - Germany 5. Aluminum alloys - Welding - Germany 6. Aluminum-magnesium alloys - Welding - Germany 7. Aluminum-magnesium alloys - Corrosion - Germany 8. Aluminum-magnesium cerium alloys - Germany 9. Leipzieger Leicht-Metallwerke A. G., Rackwitz, Ger. 10. Micro BIOS FD 3029/49, frames 1-11.

English abstract included. Abstract available as PB 105436s. 1p. Microfilm $1.25, Photostat $1.25.

INTERROGATIONS OF OTHMAR RUTHNER ON SURFACE TREATMENT AND ELECTROPOLISHING OF METALS, by Paul W. Lewin, L. Whitby and others. British Intelligence Objectives Sub-Committee. 1947. 9f Microfilm $1.25, Photostat $1.25. PB 105434

1. Light metals - Surface treatment - Germany 2. Steel, Strip - Plating - Germany 3. Steel - Coatings, Silicon - Germany 4. Aluminum - Electropolishing - Germany 5. Micro BIOS FD 3032/49, Frames 1-8.

English abstract included. Abstract available as PB 105434s. 1p. Microfilm $1.25, Photostat $1.25.

METAL TO METAL BONDING, REPORTED BY J. S. FITZGERALD, AUSTRALIAN SCIENTIFIC AND TECHNICAL MISSION. BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE. B.I.O.S. TRIP. NO. 3000. n.d. 3f Microfilm $1.25, Enlargement Print $1.50. PB 105659

1. Adhesives - Metal to metal - Germany 2. Desmodur T (Trade name) 3. Polystal U (Trade name) 4. BIOS FR 1208 5. Micro BIOS FD 3099/48, Frames 1-2.

Abstract included.

MISCHMETAL ALUMINUM ALLOY FOR ELEVATED TEMPERATURE SERVICE, by B. M. Loring, W. H. Baer, and C. G. Ackerlind. U. S. Naval Research Laboratory. Nov 1951. 22p Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. Mimeo: $.75. PB 105749

The metallurgical and mechanical characteristics of a newly developed aluminum-mischmetal alloy (11% mischmetal, 1.5% Cu, 1.25% Ni, 1.0% Mn, 0.3% Cr, 0.02% Ti), termed SAM, have been investigated. The SAM alloy is shown to have stress-rupture properties superior to present commercial alloys in the range of 700°-800°F (370°-427°C). Room temperature strength is low, however. Room temperature ductility while also low, is in the range of commercial cast aluminum alloys. Standard foundry practice for aluminum alloys may be applied to the casting of the SAM alloy. While the alloy is readily forgeable, the stress-rupture properties of the wrought form are decidely inferior to those of the cast form. Final report. Earlier reports are M-2855 and M-3434. NRL R 3871.

PRELIMINARY NOTE ON THE USE OF LIGHT ALLOYS HAVING HIGH VALUES OF THE MODULUS BUT LOW PROOF STRESSES, by H. L. Cox. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Jan 1947. 6p graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.50. PB 105333

1. Alloys, Light metal - Extrusion - Gt. Brit. 2. Aluminum alloys - Extrusion - Gt. Brit. 3. Materials, Aircraft - Stress analysis - Gt. Brit. 4. Mathematics, Applied - Aerodynamics - Gt. Brit. 5. Alloys, Light metal - Stresses - Gt. Brit. 6. Aluminum alloys - Stresses - Gt. Brit. 7. ARC RM 2488.

Cover date is 1951. S. O. Code no. 23-2488.

QUARTERLY REPORT, 13TH, MAY 1, 1949-JULY 31, 1949. Institute for the Study of Metals, University of Chicago. 1949. 185p photos, drawings, diagrs, graphs, tables Microfilm $6.75, Photostat $23.75. PB 105083

1. Thermometers, Noise 2. X-rays - Cameras 3. Powders - X-ray inspection 4. Cerium - Structure 5. B-brass - Elasticity 6. Aluminum - Thermal properties 7. Sound - Speed 8. Helium - Adsorption 9. Adsorption - Research 10. Sound - Transmission 11. Lead-gold alloys - Thermodynamics 12. Manganese fluorides 13. Gallium chloride 14. Metals - Microstructure 15. Copper - Embrittlement 16. Bismuth - Effect on copper 17. Friction - Measurements.

Papers have been submitted to various journals for publication. Contents: I. Absolute noise thermometer for high temperature and high pressure, by J. B. Garrison and A. W. Lawson. - II. X-ray camera for obtaining powder pictures, by A. W. Lawson and N. A. Riley, - III. Concerning the high pressure allotropic modification of cerium, by A. W. Lawson and Ting-Yuan Tang. - IV. Elastic constants of beta-brass, by D. Lazarus. - V. Analysis of the temperature coefficient of shear modulus of aluminum, by T. S. Ke. - VI. Ultrasonic velocities of sound in some liquid metals, by O. J. Kleppa. - VII. Anomalous adsorption of helium at liquid helium temperatures, by Earl A. Long and Lothar Meyer. - VIII. Anomalous adsorption of helium at liquid helium temperatures, by W. Band. - IX. Non-equilibrium phenomena in a Bose-Einstein gas. I: Transmission of second sound, by W. Band. - X. Thermodynamic study of liquid metallic solutions. I: System lead-gold, by O. J. Kleppa. - XI. Paramagnetic anisotropy of manganous fluoride, by J. W. Stout and Maurice Griffel. - XII. Thermodynamical treatment of very small solid solubilities, by Lester Guttman. - XIII. Extraction of gallium chloride by isopropryl ether, by Norman H. Nachtrieb and Robert E. Fryxell. - XIV. Oriented arrangements of the aluminum films formed on ionic substrates, by T. N. Rhodin. - XV. Studies of interface energies in some aluminum and copper alloys, by K. K. Ikeuye and Cyril S. Smith - XVI. Micro-sampling and microanalysis of metals, by Donald F. Clifton and Cyril S. Smith. - XVII. Interference of growing spherical precipitate particles, by C. Wert and C. Zener. - XVIII. Grain boundary relaxation and the mechanism of embrittlement of copper by bismuth, by T. S. Ke. - XIX. Apparatus for measurement of extremely high internal friction, by T. S. Ke and Marc Ross. - XX. Technical report to the Office of Naval Research, by C. Zener. XV-XIX are reports on research under Contract N6ori-20-IV, NR019302.

QUARTERLY REPORT, 15TH, NOV 1, 1949-JAN 31, 1950. Institute for the Study of Metals, University of Chicago. 1950. 116p photos, diagrs, graphs, tables

Microfilm $4.75, Photostat $15.00. PB 105098

1. X-rays - Cameras 2. Crystals - Lattices - Constants 3. Salt solutions - Polarographic analysis 4. Tin-gold systems - Thermodynamic properties 5. Iron alloys - Martensite content 6. Metals - Diffusion 7. Aluminum-copper alloys - Internal friction 8. Friction - Measurements.

Papers have been submitted to various journals for publication. Contents: I. Low temperature X-ray diffraction apparatus, by Donald F. Clifton. - II. Modification of the Cohen procedure for computing precision lattice constants from powder data, by James B. Hess. - III. Polarography in fused salts, by Martin Steinberg and Norman H. Nachtrieb. - IV. Thermodynamic study of liquid metallic solutions. II: System tin-gold, by O. J. Kleppa. - V. Crystallographic mechanism of the martensite reaction in iron-carbon alloys, by J. S. Bowles. - VI. Ring diffusion in metals, by Clarence Zener. - VII. Anomalous internal friction associated with the precipitation of copper in cold-worked Al-Cu alloys, by T'ing-Suike. VI-VIII are reports on research under Contract N6-ori-20-IV, NR019302.

REPORT ON INTERROGATION OF PROFESSOR LUYKEN, SOME TIME OF THE K.W.I., DÜSSELDORF, DEALING WITH THE PREPARATION OF IRON ORES, PARTICULARLY LOW GRADE. British Intelligence Objectives Sub-Committee. Aug-Nov 1947. 48f photos, drawings, diagrs, graphs, tables (Text in German and English) Microfilm $2.50, Enlargement Print $7.50. PB 105441

1. Iron ores - Magnetic roasting - Germany 2. Iron ores - Sintering - Germany 3. Lurgi process (Iron ore concentration) 4. Kaiser Wilhelm Institut für Eisenforschung, Düsseldorf, Ger. 5. Micro BIOS FD 3015/49, Frames 1-44.

Abstract included. Abstract available as PB 105441s. 2p. Microfilm $1.25, Photostat $1.25. Includes list of his published reports and two reprints from Mitteilungen der Kaiser Wilhelm Institut für Eisenforschung, one from bd. 11, lfg. 6, p. 95-107 with title: Magnestische röstung von eisenerzen (Magnetic roasting of iron ores) von Walter Luyken und Ernst Bierbrauer; the other with title: "Betriebmässige erprobung der magnetisierenden röstung von eisensandstein und eisenerzen (Technical scale testing of magnetising roasting of iron sandstone and iron ores).

ROTOGENERATIVE DETECTION OF CORROSION CURRENTS, by Joseph B. McAndrew, William H. Colner and Howard T. Francis. U. S. National Advisory Committee for Aeronautics. Nov 1951. 12p photos, diagr, graphs Microfilm $1.75, Photostat $2.50. PB 105539

A new technique for studying corrosion phenomena is described which permits the detection of the presence of currents produced by local cells on the surface of a corroding metal specimen. A cylindrical specimen is rotated at several hundred revolutions per minute in the corrosion medium. A small reference electrode is positioned as near the specimen as possible, thus scanning the surface of the metal. The signal produced is amplified and applied to an oscilloscope, together with a suitably synchronized sweep voltage. A standing pattern is produced on the oscilloscope which is a reproduction of the potential fields set up in the corrosion medium by the currents flowing between the elements of local cells. NACA TN 2523.

RUPTURE PROPERTIES OF LOW-CARBON N-155 TYPE ALLOYS MADE WITH A COLUMBIUM-TANTALUM FERRO-ALLOY, by J. W. Freeman, E. E. Reynolds and A. E. White. U. S. National Advisory Committee for Aeronautics. Oct 1951. 11p graphs, tables Microfilm $1.75, Photostat $2.50. PB 104949

An experimental columbium-tantalum ferro-alloy was substituted for ferro-columbium in making laboratory heats of low-carbon N-155 alloy and an N-155 type alloy (20Cr-20Ni-20Co+2Cb). This substitution had no significant effect upon stress-rupture and creep properties of either alloy at 1200° and 1500° F. The results indicate the probable practicality of using high-tantalum ferro-columbium for making columbium-bearing heat-resistant alloys. In addition to using columbium not otherwise available, an actual reduction of the amount of columbium used is indicated. NACA TN 2469.

STUDY OF ELASTIC AND PLASTIC STRESS CONCENTRATION FACTORS DUE TO NOTCHES AND FILLETS IN FLAT PLATES, by Herbert F. Hardrath and Lachlan Ohman. U. S. National Advisory Committee for Aeronautics. Dec 1951. 23p diagrs, graphs, table Microfilm $2.00, Photostat $3.75. PB 105816

Six large 24S-T3 aluminum-alloy-sheet specimens containing various notches or fillets were tested in tension to determine their stress concentration factors in the elastic and plastic ranges. The elastic stress concentration factors were found to be slightly higher than those predicted by other methods. A generalization of a relation presented by Stowell gave good agreement with the plastic stress concentration factors as they decreased with increasing plastic strain. NACA TN 2566.

SURVEY OF CREEP IN METALS, by A. D. Schwope and L. R. Jackson. U. S. National Advisory Committee for Aeronautics. Nov 1951. 66p graphs, table Microfilm $3.00, Photostat $8.75. PB 105538

This report summarizes numerous theories relating to creep phenomena and the extent of current knowledge on the subject. Various possible mechanisms by which creep occurs both in single crystals and in polycrystals are described. An extensive bibliography of published works in this field is also included. NACA TN 2516.

SYMPOSIUM ON VAPOR DEPOSITION OF METALS, PREPARED BY PANEL ON ORDNANCE MATERIALS, COMMITTEE ON ORDNANCE. U. S. Research and Development Board. May 1950. 76p diagr, graphs, tables Microfilm $3.50, Photostat $10.00. PB 105191

1. Metals - Plating 2. Coatings - Vapor deposition 3. Plating - Carbonyl process 4. RDB DS 42.

J. R. Townsend, Chairman. Contents: Presentation of Armed Service problems, by Mr. Cornthwaite, Mr. Levine, Mr. Whitmore. - Review of plating by vapor deposition, by Mr. Ellis. - Applications of plating by vapor deposition, by Dr. Blum. -

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Surface structure & surface properties of glass - W. Weyl - J. Am Ceram. Soc. v. 32 No. 8

Carbonyl process for plating certain metals, by Dr. Lander and Dr. Marden. - Discussion of halide decomposition, by Dr. Gonser. - Group discussion.

BIBLIOGRAPHICAL SURVEY OF THE DEVELOPMENT AND USE OF SUBSTITUTE MATERIALS FOR NON-FERROUS METALS AND ALLOY STEELS IN GERMANY. Gt. Brit. Dept. of Scientific and Industrial Research. Technical Information and Documents Unit, London, England. Jun 1951. 47p Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.40. PB 105214

1. Metals, White - Substitutes - Bibliography - Germany 2. Metals, Non-ferrous - Substitutes - Bibliography - Germany 3. Steel alloys - Substitutes - Bibliography - Germany 4. Zinc - Substitutes - Bibliography - Germany 5. Copper - Substitutes - Bibliography 6. Tungsten - Substitutes - Bibliography - Germany 7. Nickel - Substitutes - Bibliography - Germany 8. Molybdenum - Substitutes - Bibliography - Germany 9. Vanadium - Substitutes - Germany 10. Cobalt - Substitutes - Germany 11. Manganese - Substitutes - Bibliography - Germany 12. Cadmium - Substitutes - Bibliography - Germany 13. Bronze - Substitutes - Bibliography - Germany 14. Lead - Substitutes - Bibliography - Germany 15. Tin - Substitutes - Bibliography - Germany 16. TIDU RMS-2. S. O. Code no. 47-164.

THEORY OF THE TRANSPORT PHENOMENA IN METALS, by E. H. Sondheimer. Massachusetts Institute of Technology. Research Laboratory of Electronics, Cambridge, Mass. Mar 1950. 32p graphs, tables Microfilm $2.25, Photostat $5.00. PB 105834

Exact expressions, valid for all temperatures, are obtained in the form of infinite determinants for the electrical conductivity, the thermal conductivity and the thermoelectric power of a degenerate gas of quasi-free electrons interacting with the ionic lattice of a metal. It is shown that the values of the electrical and thermal conductivities, in general, exceed the values given by the approximate interpolation formulae due to Bloch, Wilson and others, and, in particular, that the Grüneisen-Bloch formula for the ideal electrical resistance is appreciably in error in the region close to the Debye temperature. It is further shown that the residual and ideal resistances of an impure metal are not strictly additive in the region where the two are of the same order of magnitude. The behavior of the thermal conductivity is shown to agree qualitatively with the discussion based on Wilson's formula given by Makinson; the numerical values of the thermal conductivity, however, are increased appreciably, particularly for an ideal metal at low temperatures. The thermoelectric power is also discussed, but no simple results can be given for the intermediate temperature range. Dept. of the Army project no. 3-99-10-022. Signal Corps project no. 102B. SIG Contract W36-039-sc-32037. MIT RLE TR 150.

METEORALOGY AND CLIMATOLOGY

SUMMARY OF METEOROLOGICAL CONDITIONS ASSOCIATED WITH AIRCRAFT ICING AND A PROPOSED METHOD OF SELECTING DESIGN CRITERIONS FOR ICE-PROTECTION EQUIPMENT, by Paul T. Hacker and Robert G. Dorsch. U. S. National Advisory Committee for Aeronautics. Nov 1951. 35p graphs Microfilm $2.25, Photostat $5.00.

PB 105803

Data on the meteorological parameters pertinent to the aircraft icing problem are so summarized as to give the frequency of occurrence of observed icing situations according to two of the parameters. The summarized data indicate that statistical relations exist between some of the parameters. A method, based upon the collection efficiency of an airfoil and the frequency of occurrence of icing situations with various liquid-water contents and mean-effective droplet sizes, is proposed for the selection of design criterions for ice-protection equipment. The method provides a convenient means of calculating the percentage of icing encounters in which the water collection rate exceeds the design rate. NACA TN 2569.

MINERALS AND MINERAL PRODUCTS

ACTIVE OXYGEN FORMED AT THE SURFACE OF SILICA AND CLAY AS A POSSIBLE CAUSE OF SILICOSIS, by W. A. Weyl. Pennsylvania State College. School of Mineral Industries, State College, Pa. Aug 1949. 3p Microfilm $1.25, Photostat $1.25.

PB 105045

1. Silicosis - Causes 2. Silica - Toxicity 3. Silica - Oxidation 4. PSC SMI TR 10.
Contract N6onr-269, Task order 8, NR 032-265.

ELECTRICAL CONDUCTIVITY OF LIQUID SELENIUM AND SELENIUM-TELLURIUM MIXTURES, by B. Lizell. Massachusetts Institute of Technology. Laboratory for Insulation Research, Cambridge, Mass. Sep 1951. 38p diagrs, graphs, tables Microfilm $2.25, Photostat $5.00. PB 105589

The electrical conductivity of liquid selenium and selenium-tellurium mixtures was studied in detail. Measurements in the temperature range 230° to 500°C from d.c. to 1 mc indicated the conductivities to be frequency-independent at low field strength (< 5 v/cm). For larger fields (5 to 250 v/cm) the conductivity increases and higher d.c. than a.c. values result. Adding increasing amounts of tellurium to selenium produced a continuous rise in conductivity from 1.26×10^{-4} ohm^{-1} cm^{-1} (pure Se) to 2.08×10^{-1} ohm^{-1} cm^{-1} (50.3 percent Se, 49.7 percent Te) at 480°C and a decrease in activation energy from 1.14 ev to 0.84 ev. Comparatively good reproducibility was obtained in the measurements. An attempt to study ionic migration in liquid selenium by tracer methods has thus far not given satisfactory results. The conductivity values obtained for pure selenium are in good agreement with those presented by Henkels but disagree with those of Borelius. The electrical characteristics of liquid selenium and selenium-tellurium mixtures indicate that hole con duction as pictured for semiconductors in the solid state cannot be considered as an adequate explanation of the conduction process in these liquids. A complex mixture of conduction by electrons, holes, and ions is believed to exist. O.N.R. Contract N5 ori-07801. MIT LIR TR 47.

the dielectric properties of glass. W Weyl J Soc of Glass Tech. v. 33 T-220-38 (1949)

FIRING OF COMMON BRICKS, by W. Noble, with a foreword by A. T. Green. Gt. Brit. Ministry of Works. National Brick Advisory Council. 1950. 131p fold, diagr, tables, graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.70. PB 105196

1. Brick industry - Gt. Brit. 2. Bricks - Manufacture - Gt. Brit. 3. Kilns - Performance - Gt. Brit.

Paper four. Cover date is 1951. S. O. Code no. 70-513-4*.

FORMATION OF A SULPHATE GLASS, by T. Forland and W. A. Weyl. Pennsylvania State College. School of Mineral Industries, State College, Pa. Oct 1949. 7p table Microfilm $1.25, Photostat $1.25. PB 105086

1. Glass, Sulfate - Formation 2. PSC SMI TR 13.

Contract N6 onr-269, Task order 8, NR 032-265.

FUNDAMENTAL STUDIES OF CERAMIC MATERIALS, FINAL SUMMARY REPORT JAN 1946-MAR 1949, by H. Z. Schofield, J. F. Lynch, and W. H. Duckworth. Battelle Memorial Institute, Columbus, Ohio. Mar 1949. 130p photos, diagrs, graphs, tables Microfilm $5.00, Photostat $16.25. PB 105078

1. Ceramic materials - Properties 2. Ceramic materials - Research 3. Ceramic materials, High temperature 4. Jet propelled devices - Materials 5. Alumina - Properties 6. Beryllium oxides - Properties 7. Zircon - Properties.

Contract N5 ori-111, Task order I, Project NR032-181. Includes appendix, Aug 23, 1949.

GERMAN LIMESTONE QUARRIES: DISPOSAL OF WASTE SLURRY FROM WASHING PLANTS IN MECHANISED LIMESTONE QUARRIES, REPORTED BY A. Ratcliffe, V. F. Batten, R. G. Jackson. British Intelligence Objectives Sub-Committee. B.I.O.S. trip no. 3257. 1947. 95f photos, drawings, diagrs Microfilm $4.25, Enlargement Print $13.75. PB 105727

1. Lime - Quarries and quarrying - Waste disposal - Germany 2. Stein & Erden G.m.b.H., Goslar, Ger. 3. Rheinische Kalksteinwerke G.m.b.H., Wulfrath, Ger. 4. Rheinische Westfalische Kalkwerke A. G., Dornap, Ger. 5. Unterharzer Berg-u-Huttenwerke G.m.b.H., Goslar, Ger. 6. Preussische Bergwerks-u-Hutten A. G., Grund, Ger. 7. BIOS FR 1684 8. Micro BIOS FD 2247/49, Frames 1-85.

Abstract included. See also BIOS FR 1684 (PB 93630).

INTERROGATION REPORT ON THE MANUFACTURE OF REFRACTORIES AND ELECTRICAL PORCELAIN, by Otto Rath. Jun 1946. 3f Microfilm $1.25, Enlargement Print $1.50. PB 105438

1. Refractory materials - Manufacture - Germany 2. Porcelain - Manufacture - Germany 3. Micro BIOS FD 3026/49, Frames 1-2.

Abstract included. Abstract available as PB 105438s. 1p. Microfilm $1.25, Photostat $1.25.

MORPHOLOGY AND STRUCTURE OF THE SERPENTINE MINERALS, by Thomas F. Bates and John F. Mink. Pennsylvania State College. School of Mineral Industries, State College, Pa. Sep 1950. 37p photos, tables Microfilm $2.25, Photostat $5.00. PB 105569

1. Serpentine - Structure 2. Antigorite - Structure 3. Chrysotile - Structure.

Contract no. N6 onr-26914, NR081-098, Technical report no. III.

PLANT FOR PRESTRESSING CONCRETE. Gt. Brit. Ministry of Works. Revised. Feb 1951. 21p photos Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.40. PB 105766

1. Concrete, Prestressed - Gt. Brit. 2. Concrete - Manufacture - Apparatus - Gt. Brit. 3. Grips - Wire - Gt. Brit. 4. DSIR NB B12.

PORTLAND CEMENT CONCRETE, by R. C. DeHart. Montana. Engineering Experiment Station, Bozeman, Montana. Dec 1950. 7p photos, tables Available from The Director, Montana State College Engineering Experiment Station, Bozeman, Montana. PB 105238

1. Concrete - Manufacture 2. Concrete, Air entrained 3. Concrete - Mix proportions 4. MO EES B12.

PREPARATION OF SILICONE COMPOUNDS FOR USE IN HIGH-TEMPERATURE ORGANIC FINISHES, by W. E. Weaver. U. S. Naval Research Laboratory. Oct 1951. 24p tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. Mimeo: $.75. PB 105748

The need for a finish able to withstand relatively high temperatures has resulted in an investigation of silicone polymer systems. The preparation of various silane monomers was studied by both the Grignard and direct methods. A number of alkyl silicones as well as many aryl-alkyl silicones were prepared using available chlorosilanes. The preparation of aryl-alkyl silicones directly from the Grignard reaction has also been investigated. Preliminary to the preparation of fluoroaryl silicones (expected to be thermostable because of the inactivating effect on the phenyl ring by the fluorine atom) a number of aromatic bromofluoro-aryl compounds were prepared. NRL R 3870.

RESEARCH ON THE ELEMENT SILICON AND SILICON ALLOYS, by W. R. Johnson and M. Hansen. Armour Research Foundation, Chicago, Ill. Jun 1951. 131p photos, drawings, diagrs, graphs, tables Microfilm $5.50, Photostat $17.50. PB 105807

The element silicon is non-metallic in character, with a covalent diamond-type crystal lattice. Experimental evidence shows that this structure is stable up to at least 1317°C, which is within about 110° of its melting point. Hot hardness tests indicate that silicon lacks any appreciable degree of ductility, although extremely slight deformation may occur, apparently exclusively by twinning, before cleavage takes place. Phase relationships in numerous binary silicon-rich alloys -- including those with titanium, zirconium, molybdenum, tantalum, and tungsten, investigated for the first time -- have been studied metallographically. In most cases, the alloys consist of a mixture of silicon and the disili-

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cide of the alloying element. There appears to be no possibility of obtaining a ductile metallic lattice structure in a high-silicon alloy, either by high-temperature allotropic transformation or by alloying. A survey of the literature on the preparation and properties of silicon is included in this report. Contract no. AF 33(038)-8517. Contains appendix: Study of crystallography of silicon and its alloys and related elements, by S. W. Bradstreet, Jr. and L. E. Marchi. AAF TR 6383.

ORDNANCE AND ACCESSORIES

REPORT ON THE INTERROGATION OF DR. KURT STENGE, SENIOR EXTERNAL BALLISTICAN OF MESSRS. KRUPPS AT ESSEN, REPORTED by Col. G. H. Hinds. British Intelligence Objectives Sub-Committee. Nov 1945. 5f Microfilm $1.25, Enlargement Print $1.50. PB 105730

1. Projectiles - Research - Germany 2. Projectiles - Trajectories - Germany 3. Rockets - Firing - Germany 4. BIOS FR 115 5. Micro BIOS FD 3016/48, Frames 1-5.

PHOTOGRAPHIC AND OPTICAL GOODS

INDESYN, A TELEVISION SYSTEM WITHOUT TRANSMITTED SYNCHRONIZATION, by Gregory E. Berens. U. S. Air Materiel Command. Engineering Division. Aircraft Radiation Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio. May 1949. 11p diagrs Microfilm $1.75, Photostat $2.50. PB 105662

This report comprises an analysis of television synchronization, which was conducted in order to determine under what conditions synchronization signals may be eliminated from the transmitted television signal. Elimination of synchronization signals from the television signal has important advantages applicable. It is hoped that this report will assist engineers faced with the problem of designing a television system to gain these advantages or to prevent costly error. AAF TR 5819.

PHYSICS

General

APPLICATION OF VARIATIONAL METHODS TO TRANSONIC FLOWS WITH SHOCK WAVES, by Chi-Teh Wang and Pei-Chi Chou. U. S. National Advisory Committee for Aeronautics. Nov 1951. 32p diagrs Microfilm $2.25, Photostat $5.00. PB 105574

By modifying Bateman's variational principle for irrotational flows, it is shown that a variational principle for flows with rotation and variable entropy can be obtained. By applying this variational principle to the regions of flow behind shock waves and Bateman's original principle to the other regions in the fluid, shock equations can be directly obtained. A procedure for computing numerical solutions for such flows is suggested, and a numerical example is carried out. The results show that when the Mach number increases to a certain limiting value without allowing for shockwaves the variational method does not have a solution. This probably indicates the breakdown of the irrotational flow. By allowing shock waves to occur, solution again exists. NACA TN 2539.

BEITRAG ZUR BERECHNUNG DER TURBULENTEN GRENZSCHICHTEN (CONTRIBUTION TO THE THEORY OF TURBULENT BOUNDARY LAYERS), by J. Rotta. Translated by E. N. Labouvie. Nov 1951. 26p graphs Microfilm $2.00, Photostat $3.75. PB 105606

1. Boundary layer, Turbulent - Theory - Germany 2. Max-Planck-Institut für Strömungsforschung, Göttingen, Ger. 3. DW-TMB T242.

Translation of report issued by the Max-Planck-Institut für Strömungsforschung in Göttingen, July 1, 1950.

FLOW MEASUREMENT BY PIPE ELBOWS, by H. F. Mullikin and J. M. Batch. Montana. Engineering Experiment Station, Bozeman, Montana. Dec 1950. 5p drawings, graphs Available from The Director, Montana State College Engineering Experiment Station, Bozeman, Montana. PB 105236

1. Flow - Measurements 2. Pipe lines - Elbows 3. MO EES B10.

FOUNDATION OF THE THEORY OF ESTIMATION, by Jerzy Neyman. California. University, Berkeley, Calif. Nov 1949. 26p Microfilm $2.00, Photostat $3.75. PB 105046

1. Mathematical research 2. Mathematical solutions and equations.

Speech prepared for the International Congress on Philosophy of Science, Paris, Oct 17-22, 1949. Project NR 042-036, Technical report no. 16.

GENERAL THEORY CONCERNING THE WAVE MAKING RESISTANCE OF A SOLID IN MOTION THROUGH A FLUID OF FINITE DEPTH, BY M. D. HASKIND. TRANSLATED by Rose Jermain, edited by Margaret W. Raven. Oct 1951. 16p Microfilm $1.75, Photostat $2.50. PB 105841

1. Hydrodynamic - Theory - Russia 2. Bodies, Submerged - Resistance - Russia 3. Waves in water - Theory - Russia 4. Mathematics, Applied - Russia 5. STS 113 6. NAVSHIPS T435.

Translated from Applied Mathematics and Mechanics, vol. 9, 1945.

LAMINAR HEAT CONVECTION IN PIPES AND DUCTS by C. S. Yih and Jack E. Cermak. Colorado Agricultural and Mechanical College. Civil Engineering Dept. Fort Collins, Colo. Sep 1951. 22p graphs, tables Available from Civil Engineering Dept., Colorado A and M College, Fort Collins, Colo. PB 105524

Laminar heat convection in pipes and ducts is treated rather exhaustively for different boundary conditions. Eigenvalues and eigenfunctions are computed for certain simple boundary conditions. Extensions to more complicated boundary conditions are explicitly given. Report no. 5 under Contract N9 onr-82401, NR063-071/1 19-49.

MOMENT ACTING ON A RANKINE OVOID MOVING UNDER A FREE SURFACE, by Hartley L. Pond. U. S. David W. Taylor Model Basin, Washington, D.C. Nov 1951. 25p diagr, graphs Microfilm $2.00, Photostat $3.75. PB 105854

The moment acting on a Rankine Ovoid moving under the free surface of a fluid of infinite depth is calculated. In order to account for the effect of the waves formed by the motion of the body a correction is given in the form of a second approximation. DWTMB 795.

O DVIZHENII ZHIDKOSTI V POGRANICHNOM SLOE VBLIZI LINII PERESECHENIA DVUKH PLOSKOSTEI (ON MOTION OF FLUID IN BOUNDARY LAYER NEAR LINE OF INTERSECTION OF TWO PLANES), by L. G. Loitsianskii and V. P. Bolshakov. Nov 1951. 27p diagrs, graphs, tables Micorfilm $2.00, Photostat $3.75. PB 105577

A motion of a slightly viscous incompressible fluid that flows between two semi-infinite planes which intersect at an angle between 0^{o} and 180^{o} is discussed. The increase in thickness of the boundary layer near the line of intersection of the two planes, the limits of the effect of the corner, and the effect on the drag are determined. The analysis is made for both laminar and turbulent flow by using the momentum theorem and assuming suitable velocity profiles. Translation from Central Aero-Hydrodynamical Institute, Transactions, Rept. 279, 1936, p. 3-18. NACA TM 1308.

ON THE THEORY OF THERMAL FLUCTUATIONS, OR GENERALIZED NOISE, by Herbert B. Callen and Theodore A. Welton. Pennsylvania. University. Nov 1950. 21p Microfilm $2.00, Photostat $3.75. PB 105565

A relation is obtained between the kinetic coefficients and the fluctuations in the generalized forces in linear dissipative systems. This relation forms the extension of the well-known Nyquist relation for the voltage fluctuations in electrical impedances. Applications are made of the general formalism to several particular types of systems, including Brownian motion, electric field fluctuations in the vacuum, and pressure fluctuations in a gas. Technical report no. 1 under Contract Nonr-15600.

TABLE OF NORMALIZED PARABOLIC COORDINATES AND ARC LENGTHS, by R. C. Spencer and G. E. Reynolds. U. S. Air Force. Cambridge Research Laboratories, Cambridge, Mass. Jul 1951. 7p graphs, table Microfilm $1.25, Photostat $1.25. PB 105560

A table of parabolic coordinates and corresponding arc lengths is presented, with the semilatus rectum $l = 2f$ normalized to unity. If α denotes x/l, the ordinate y/l is $\alpha^2/2$ and the arc length s/l is $1/2\,(\alpha\sqrt{1+\alpha^2} + \operatorname{arcsinh}\alpha)$. These functions are listed to five decimal places in steps of 0.01 from $\alpha = 0.00$ to $\alpha = 2.00$. AAF CRL E.4083.

PHYSIOLOGY

INFLUENCE OF POLYCYTHEMIA PRODUCED AT HIGH ALTITUDE ON RESISTANCE TO INFECTION, V: RESPONSE OF WEBSTER'S INBRED BACTERIAL RESISTANT AND BACTERIAL SUSCEPTIBLE STRAINS TO SALMONELLA TYPHIMURIUM INFECTION, BY L. JOE BERRY, AND ROLAND B. MITCHELL WITH THE TECHNICAL ASSISTANCE OF ELENORE SCHEWE AND ELIZABETH TRAVAGLINO. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Nov 1951. 5p graph, tables Microfilm $1.25, Photostat $1.25. PB 105623

Webster's inbred strains of bacterial resistant and bacterial susceptible mice were adapted to an altitude of 15,000 to 20,000 feet for three weeks. These mice, infected intraperitoneally with Salmonella typhimurium after one day of recovery at atmospheric pressure, were more susceptible than the corresponding control mice of each strain. The greater susceptibility of these altitude-adapted mice proves that the same findings in earlier experiments with CF 1 mice are not attributable to their genetic heterogeneity. However, the small differences in survival of the control mice of each strain indicates that the infectious dose was too large for optimum results. Contract number AF 33(038)-17842. AAF SAM Proj. 21-35-005, Report no. 5.

PSYCHOLOGY

COMPARISON OF FOUR TECHNIQUES FOR PRODUCING SPREAD ON RATING SCALES, by Morton Wagman. Michigan. University. Dept. of Psychology. June 1950. 13p tables Microfilm $1.75, Photostat $2.50. PB 105367

1. Psychology, Applied 2. Psychological tests - Rating scales 3. Conference research project.

Publication no. 8 of the Conference research project under Contract N6 onr-232, T. O. 7.

PSYCHOLOGICAL STUDIES OF TRACKING BEHAVIOR. PART IV: INTERMITTENCY HYPOTHESIS AS A BASIS FOR PREDICTING OPTIMUM AIDED-TRACKING TIME CONSTANTS, by L. V. Searle. U. S. Naval Research Laboratory. Oct 1951. 13p photo, graphs, table Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D.C. Mimeo: $.50. PB 105750

Evidence indicates that the human operator's corrections of observed errors during continuous tracking occur intermittently, at a typical frequency of about 2 per second. This intermittency hypothesis is based upon (a) the typical 0.5-second periodicity of tracking-error curves and (b) analogy with response to step-function presentations, from which it is known that the time for initial reaction plus response movement is in the order of 0.5 second. The intermittency hypothesis was used as a basis for predicting optimum time constants for an aided-tracking control mechanism. The study employed a tracking device in which the operator was provided with acceleration control as well as with the conventional position and rate response components. With a small number of assumptions in addition to intermittency it was deduced that the control-handle sensitivities in position, rate, and acceleration should be in the ratio of 1:4:8, respectively, for maximum tracking accuracy. In a series of tests the empirically obtained optima prove to be either the same or nearly the same as the predicted optimum. It is concluded that consideration should be given to including the acceleration component in the design of human-operated control tracking devices. NRL R 3872.

TRANSPORTATION EQUIPMENT

Aeronautics

Aircraft

AIRCRAFT FLUTTER, by J. Williams. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Aug 1948. 62p diagr Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $3.00. PB 105229

1. Airfoils, Oscillating - Loads - Great Britain 2. Flutter - Research - Great Britain 3. Control surfaces - Flutter - Great Britain 4. Tabs, Control - Flutter - Great Britain 5. Rudders, Aircraft - Flutter - Great Britain 6. Wings - Flutter - Great Britain 7. Wings - Aerodynamics - Bibliography - Great Britain 8. ARC RM 2492.

Cover date is 1951. S. O. Code no. 23-2492. Contents: Part 1: General methods for the investigation of aircraft flutter, p. 3-19. - Part II: Applied investigations on aircraft flutter, p. 20-37. - Part III: Experimental determination of airloads on oscillating aerofoil systems, p. 37-55. - Appendix: Bibliography of researches on the aerodynamic theory of wings in non-uniform motion, p. 56-62.

APPLICATION OF RESPONSE FUNCTION TO CALCULATION OF FLUTTER CHARACTERISTICS OF A WING CARRYING CONCENTRATED MASSES, by H. Serbin and E. L. Costilow. U. S. National Advisory Committee for Aeronautics. Nov 1951. 52p diagrs, graphs, tables Microfilm $2.75, Photostat $7.50. PB 105682

Concepts involved in the harmonic-response-function method, such as the direct or conjugate characteristic modes, are illustrated by application of the method to the calculation of the change in flutter characteristics of a wing due to adding concentrated masses. The rigid body is first idealized as a point mass, then as a distributed mass. The main purpose of the numerical procedures which are given is to illustrate the scope of the method and to make some of its abstract formulations more specific. An appendix is given which contains some of the essential theoretical background. NACA TN 2540.

CALCULATION OF THE DAMPING FOR ROLLING OSCILLATIONS OF A SWEPT WING, by Doris E. Lehrian. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Oct 1950. 10p diagrs, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.50. PB 105213

1. Wings, Swept - Damping - Calculations - Great Britain 2. Wings, Swept - Vibration - Great Britain 3. Wings, Swept - Rolling moments - Great Britain 4. ARC CP 51.

Cover date is 1951. S. O. Code no. 23-9006-51.

CORRELATION OF AEROPLANE LOADING AND ACCIDENT STATISTICS, by A. G. Pugsley. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Apr 1942. 5p graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.40. PB 105227

1. Loads, Aerodynamic - Great Britain 2. Airplanes - Loading - Gt. Brit. 3. Airplanes - Accidents - Statistics - Great Britain 4. ARC RM 2682.

Cover date is 1951. S. O. Code no. 23-2682.

DETERMINATION OF SHAPES OF BOATTAIL BODIES OF REVOLUTION FOR MINIMUM WAVE DRAG, by Mac C. Adams. U. S. National Advisory Committee for Aeronautics. Nov 1951. 20p diagrs, graphs Microfilm $1.75, Photostat $2.50. PB 105802

By use of an approximate equation for the wave drag of slender bodies of revolution in a supersonic flow field, the optimum shapes of certain boattail bodies are determined for minimum wave drag. The properties of three specific families of bodies are determined, the first family consisting of bodies having a given length and base area and a contour passing through a prescribed point between the nose and base, the second family having fixed length, base area, and maximum area, and the third family having given length, volume, and base area. NACA TN 2550.

EFFECT OF RATE OF CHANGE OF ANGLE OF ATTACK ON THE MAXIMUM LIFT COEFFICIENT OF A PURSUIT AIRPLANE, by Burnett L. Gadeberg. U. S. National Advisory Committee for Aeronautics. Oct 1951. 16p photo, drawing, graphs Microfilm $1.75, Photostat $2.50. PB 105541

Flight tests have been made with a pursuit airplane to determine the effect of Mach and Reynolds numbers on the variation of the rate of change of maximum lift coefficient with rate of change of angle of attack. These tests have indicated that the rate of increase of maximum lift coefficient with increasing abruptness of the stall is significantly affected by Reynolds number as well as Mach number. Both parameters reduce this rate of increase over the lower ranges tested and increase it in the higher ranges. NACA TN 2525.

EFFECT OF TAPER RATIO ON THE LOW-SPEED ROLLING STABILITY DERIVATIVES OF SWEPT AND UNSWEPT WINGS OF ASPECT RATIO 2.61, by Jack D. Brewer and Lewis R. Fisher. U. S. National Advisory Committee for Aeronautics. Nov 1951. 17p photo, diagrs, graphs Microfilm $1.75, Photostat $2.50. PB 105691

Results of tests conducted in the 6-foot-diameter rolling-flow test section of the Langley stability tunnel to determine the effects of varying taper ratio on the rolling and static stability characteristics of a swept wing are presented; results are also given for the effects of varying taper ratio on an unswept wing and for the effects of sweep on a tapered wing. All the models were of aspect ratio 2.61 and had NACA 0012 sections normal to the quarter-chord line. Taper ratios of 1.00, 0.50, and 0.25 and sweep angles of 0° and 45° were investigated. NACA TN 2555.

EFFECTS OF WING POSITION AND HORIZONTAL-TAIL POSITION ON THE STATIC STABILITY CHARACTERISTICS OF MODELS WITH UNSWEPT AND 45°

SWEPTBACK SURFACES WITH SOME REFERENCE TO MUTUAL INTERFERENCE, by Alex Goodman. U. S. National Advisory Committee for Aeronautics. Oct 1951. 58p photos, diagrs, graphs, tables Microfilm $2.75, Photostat $7.50. PB 105496

Results are presented of an investigation made to determine the effects of wing position and horizontal-tail position on the low-speed static lateral and static longitudinal stability characteristics of airplane models having unswept and 45° sweptback surfaces. Interference increments between the various components are evaluated, and efficiency factors of the vertical tail as a function of wing position are presented. NACA TN 2504.

ESTIMATION OF WING FLUTTER SPEEDS FROM THE CURVES OF R. & M. 1869, by Mary E. K. Graham. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Apr 1942. 4p table, graph Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.35. PB 105223

1. Wings - Flutter - Calculations - Gt. Brit. 2. ARC RM 2608.

Cover date is 1951. S. O. Code no. 23-2808.

EVALUATION OF HIGH-ANGLE-OF-ATTACK AERODYNAMIC-DERIVATIVE DATA AND STALL-FLUTTER PREDICTION TECHNIQUES, by Robert L. Halfman, H. C. Johnson and S. M. Haley. U. S. National Advisory Committee for Aeronautics. Nov 1951. 154p photos, diagrs, graphs Microfilm $6.00, Photostat $20.00. PB 105680

The aerodynamic reactions on wings oscillating harmonically in pitch and translation in the stall range have been measured, evaluated, and correlated where possible with available published data. Data on the time-average values in the stall range of both lift and moment are presented. The results of numerous experimental observations of stall flutter have been reviewed and known attempts at its prediction have been examined, compared, and extended. A semi-empirical method of predicting the variations of moment in pitch with airfoil shape, reduced frequency, initial angle of attack, and amplitude of oscillation has been presented. NACA TN 2533.

EXPERIMENTAL AERODYNAMIC DERIVATIVES OF A SINUSOIDALLY OSCILLATING AIRFOIL IN TWO-DIMENSIONAL FLOW, by Robert L. Halfman, Massachusetts Institute of Technology. U. S. National Advisory Committee for Aeronautics. Nov 1951. 83p photo, diagrs, graphs, tables Microfilm $3.75, Photostat $11.25. PB 105535

Experimental measurements of the aerodynamic reactions on a symmetrical airfoil oscillating harmonically in a two-dimensional flow are presented and analyzed. Harmonic motions include pure pitch and pure translation, for several amplitudes and superimposed on an initial angle of attack, as well as combined pitch and translation. Considerable consistent data for pure pitch were obtained from a search of available reference material, and several definite Reynolds number effects are evident. NACA TN 2465.

EXPERIMENTAL INVESTIGATION OF THE LOW-SPEED STATIC AND YAWING STABILITY CHARACTERISTICS OF A 45° SWEPTBACK HIGH-WING CONFIGURATION WITH VARIOUS TWIN VERTICAL WING FINS, by Alex Goodman and Walter D. Wolhart. U. S. National Advisory Committee for Aeronautics. Nov 1951. 25p photos, diagrs, graphs, tables Microfilm $2.00, Photostat $3.75. PB 105681

Results are presented of an investigation of the low-speed static and yawing stability characteristics of a 45° sweptback high-wing, low-horizontal-tail configuration with various twin vertical fins located on the wing. The static and yawing stability characteristics obtained with the various twin-fin configurations are compared with the characteristics of a similar configuration with a single vertical tail at the rear of the fuselage. In addition, the effects of a small vertical fin at the rear of the fuselage on the characteristics of the twin-fin configurations are presented. NACA TN 2534.

FLIGHT INVESTIGATION OF THE EFFECT OF ATMOSPHERIC TURBULENCE ON THE CLIMB PERFORMANCE OF AN AIRPLANE, by Harry Press and Herbert C. McClanahan, Jr. U. S. National Advisory Committee for Aeronautics. Oct 1951. 30p graphs, tables Microfilm $2.00, Photostat $3.75. PB 105209

The results of an investigation consisting of a series of one-engine climb tests with a twin-engine transport airplane indicate that light turbulence of the type generally present in clear air over flat terrain has no significant effect on the average rate of climb for a series of runs. Turbulence does, however, increase the variation in the rate of climb from run to run. The standard deviation of the rate of climb attributable to turbulence decreases rapidly when the climb duration is increased from 1 to 5 minutes. NACA TN 2498.

GENERALIZED CONICAL-FLOW FIELDS IN SUPERSONIC WING THEORY, by Harvard Lomax and Max A. Heaslet. U. S. National Advisory Committee for Aeronautics. Sep 1951. 46p diagrs, graph Microfilm $2.50, Photostat $6.25. PB 105208

Linearized, compressible-flow analysis is applied to the study of quasi-conical supersonic wing theory. Single-integral equations are derived which relate either the loading to the shape of a lifting surface or the thickness of a symmetrical wing to the pressure distribution for triangular wings with subsonic leading edges. The forms of these equations and their inversions are simplified through the introduction of the finite part and the generalized principal part of an integral. Applications of the theory, in the lifting case, include previously known results. In the nonlifting case, it is shown that for a specified pressure distribution the theory does not always predict a unique thickness distribution. This is demonstrated for a triangular plan form having a constant pressure gradient in the stream direction. NACA TN 2497.

INCOMPRESSIBLE FLOW ABOUT A CASCADE OF AIRFOILS, by Henry W. Woolard. Cornell Aeronautical Laboratory, Inc., Buffalo, N. Y. Nov 1950. 59p diagrs, graphs, tables Microfilm $2.75, Photostat $7.50. PB 105320

By the use of the method of singularities, relations are developed which permit the calculation of the velocity distribution for a cascade of airfoils of a

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given profile or the calculation of the airfoil shape corresponding to a specified velocity distribution. In general, it is believed that the method is more versatile, shorter, and easier to apply than existing ones. These features, however, are obtained with some sacrifice in accuracy. The calculation by the present method of the velocity distribution for a given airfoil shape in cascade is much more rapid than existing methods when certain data concerning the airfoil mean line and its base profile are known "a priori". These data are: ideal angle of attack, ideal lift coefficient, pitching moment coefficient, and velocity distribution at the ideal angle of attack, for the mean line; and the surface velocity distribution at zero angle of attack for the base profile. Since these data are readily available for NACA mean lines and base profiles, the present procedure is particularly rapid in cases where the airfoil consists of an NACA mean line and base profile. When the above data are known a complete velocity distribution at a specified blade angle, solidity, and angle of attack may be calculated in approximately one hour and forty minutes; each additional velocity distribution at a different angle of attack, but at the same blade angle, and solidity, requires about fifty minutes of computation time. Because of the approximations involved, application should be limited to blade angles between 30^{o} and 150^{o}, and solidities of the order of unity or less. In addition, the airfoil camber and thickness should not be too great. A comparison with a number of examples calculated by conformal transformation reveals agreement which varies from good to fair. CAL AF-734-A-1.

INVESTIGATION OF AIRCRAFT HEATERS. XXXVII: EXPERIMENTAL DETERMINATION OF THERMAL AND HYDRODYNAMICAL BEHAVIOR OF AIR FLOWING ALONG A FLAT PLATE CONTAINING TURBULENCE PROMOTERS, by L.M.K. Boelter, G. Young, M. L. Greenfield, V. D. Sanders and M. Morgan. U.S. National Advisory Committee for Aeronautics. Oct 1951. 26p diagr, graphs Microfilm $2.00, Photostat $3.75. PB 104953

This report contains heat-transfer and pressure-drop data for air flowing over a heated flat plate containing strips of metal placed normal to the direction of air flow. The heat-transfer rates and static pressure drops are increased for this system over that for a flat plate alone because of the eddies, turbulence, and fin effect caused by the interrupters. NACA TN 2517.

INVESTIGATION OF THE AIR-COMPRESSION PROCESS DURING DROP TESTS OF AN OLEO-PNEUMATIC LANDING GEAR, by James H. Walls. U. S. National Advisory Committee for Aeronautics. Sep 1951. 17p photo, diagrs Microfilm $1.75, Photostat $2.50. PB 105205

A brief study has been made to evaluate the importance of the type of air-compression process on the loads produced on an oleo-pneumatic landing gear during impact and to determine the type of air compression process actually obtained during drop tests. A simplified analysis to determine the effect which different air-compression processes might have indicates that the value of the air-compression exponent should have relatively little effect on the landing-gear loads throughout most of the impact. The analysis of experimental data obtained in these tests shows that the polytropic exponent ranged from 1.01 to 1.10 for the conditions tested. The general trend of the data appears relatively independent of vertical contact velocity. NACA TN 2477.

LIFT AND MOMENT ON OSCILLATING TRIANGULAR AND RELATED WINGS WITH SUPERSONIC EDGES, by Herbert C. Nelson. U. S. National Advisory Committee for Aeronautics. Sep 1951. 34p diagrs, graphs Microfilm $2.25, Photostat $5.00. PB 105207

The linearized velocity potential for a thin, flat, tri-triangular or related wing with supersonic edges, undergoing harmonic torsional oscillations and vertical translations in a constant supersonic stream, is derived in terms of a frequency parameter. Closed expressions for the velocity potential, section force and moment coefficients for the triangular wing are developed to the third power of the frequency of oscillation. NACA TN 2494.

LO STATO ATTUALE DELLE RICERCHE SUL MOTO INSTAZIONARIO DI UNA SUPERFICIE PORTANTE (PRESENT STATE OF DEVELOPMENT IN NON-STEADY MOTION OF A LIFTING SURFACE) by Placido Cicala. Oct 1951. 96p diagrs, tables Microfilm $4.25, Photostat $12.50. PB 105280

A summary is given of the principal results on air forces for a wing undergoing unsteady motion in an incompressible fluid and of methods followed by various investigators, as of 1941. Part I contains results for a wing of infinite aspect ratio; part II deals with procedures for wings of finite aspect ratio; part III contains results for force components in the direction of motion (propulsion or drag); part IV considers the results of some experimental investigations. Each part contains an evaluation of existing publications. Translated from Aerotecnica, v. 21, no. 9-10, Sep. - Oct. 1941, p. 557-591, 670-685, 759-773. NACA TM 1277.

MATHEMATICAL IMPROVEMENT OF METHOD FOR COMPUTING POISSON INTEGRALS INVOLVED IN DETERMINATION OF VELOCITY DISTRIBUTION ON AIRFOILS, by I. Flügge-Lotz, Stanford University. U. S. National Advisory Committee for Aeronautics. Oct 1951. 84p graphs, tables Microfilm $3.75, Photostat $11.25. PB 105155

A solution is presented of the Poisson integral involved in the determination of the change in velocity distribution resulting from a change in airfoil profile in parallel incompressible flow. Three well developed numerical methods of evaluating this integral, all based on the division of the range of integration into small equal intervals, and the difficulties involved in each method, are discussed. A new method based on the use of unequal intervals, is developed and compared with the other methods by means of several examples. NACA TN 2451.

NOTE ON THE USE OF TIME SERIES IN THE ANALYSIS OF FLIGHT TEST SERIES, by W. P. Jones. Gt. Brit. Ministry of Supply. Aeronautical Research Countil. 1951. 28p graphs Available from British Information Services, 30 Rockefeller Plaza, New

York 20, N. Y. $1.15. PB 105159

The methods suggested in Ref. 1 for analysing the behaviour of linear systems are briefly reviewed, the numerical analysis being expressed in terms of matrices. Possible applications of time series representation to the study of aircraft stability characteristics are discussed and a detailed numerical investigation of a simple one degree of freedom undamped system is made. For this system the Tustin method of analysis in terms of Δ units seems satisfactory. An alternative method based on the use of Simpson's integration rule in conjuction with time series representation is also described. No definite conclusions can be drawn as to the advisability of using the suggested method of analysis at this stage, as it is considered particular aircraft should be made in order to check fully the accuracy of the method. ARC CP 46.

STUDY OF VORTEX SHEDDING AS RELATED TO SELF-EXCITED TORSIONAL OSCILLATIONS OF AN AIRFOIL, by Raymond L. Chuan and Richard J. Magnus. U. S. National Advisory Committee for Aeronautics. Sep 1951. 49p diagrs, graphs Microfilm $2.50, Photostat $6.25. PB 105138

Results of the experimental investigation of the self-excited torsional oscillation of an NACA 0006 airfoil suspended elastically are covered. The relationship between torsional oscillation and shedding of vortices was investigated for this airfoil. Two types of oscillation phenomena were found in the investigation. One type, exhibited by cases with angles of attack just above stall, persisted with increasing velocity without reaching any apparent limit within the range of velocity attainable in the present wind tunnel. The other type, exhibited by cases with higher angles of attack, only showed self-excited oscillations in a certain range of velocity, the range decreasing with increasing angle of attack. NACA TN 2429.

THEORETICAL FORCE AND MOMENTS DUE TO SIDESLIP OF A NUMBER OF VERTICAL TAIL CONFIGURATIONS AT SUPERSONIC SPEEDS, by John C. Martin and Frank S. Malvestuto, Jr. U. S. National Advisory Committee for Aeronautics. Sep 1951. 60p photos, diagrs, graphs Microfilm $2.75, Photostat $7.50. PB 105133

Formulas are obtained by means of the linearized theory for the lateral force due to sideslip, yawing moment due to sideslip, and the rolling moment due to sideslip for normal tail arrangements consisting of rectangular, triangular, and sweptback vertical tails of arbitrary taper and sweep mounted symmetrically on a horizontal tail of arbitrary shape. The results are restricted to cases where the leading edges are supersonic. The effect of the horizontal tail on the derivatives is evaluated for certain cases. A series of design curves is presented for the derivatives considered for certain taper ratios. NACA TN 2412.

THEORETICAL VELOCITY DISTRIBUTION IN A HIGH-SPEED TUNNEL CONTRACTION, by M. Jones and P. Bright. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Oct 1945. 9p diagrs, graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.75. PB 105221

By an arithmetical method, contours of constant Mach number have been determined in the contraction cone of a circular tunnel whose axial distribution of area was assumed to be the same as that in the Royal Aircraft Establishment High Speed Tunnel. The results show a definite tendency for the velocity to be lower on the centre line than on the wall, the difference becoming smaller as the working section is entered. Sufficient work has been done to show that the method described can be used to obtain solutions for the flow of a compressible fluid in a pipe of varying cross section, provided that there are no discontinuities in the boundaries. Cover date is 1951. S.O. Code no. 23-2601. ARC RM 2601.

WIND TUNNEL TESTS ON THE EFFECT OF ACCRETION OF ICE ON CONTROL CHARACTERISTICS IN TWO-DIMENSIONAL FLOW, by A. S. Halliday, A. S. Batson and D. K. Cox. Gt. Brit. Ministry of Supply. Aeronautical Research Council. 1951. 18p photo, drawings, graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.65. PB 105157

It was thought that a fine trailing-edge angle would reduce the adverse effect of ice accretion as compared with a blunter trailing-edge, which was a feature of the original tail, of Ref. 1 for which ice accretion was found to have dangerous effects on elevator behaviour. Some tests in two-dimensional flow reported herein were carried out at the N.P.L. to provide data for the estimation of the effect of ice accretion when the trailing-edge angle of the aerofoil section is changed. The effects of aspect ration on the results are computed and plotted in the report. The results of these tests are disappointing in that for elevators of 40% chord no advantage can be expected from a finer trailing-edge angle so far as the effects of large accretions of ice on the leading edge are concerned; but a 20% flap the finer trailing-edge appears to be superior. Larger trailing-edge angles, however, give rise to much larger changes in control characteristics due to normal shifts of transition point on the tailplane and to changes in Reynolds number. Where possible b_1 for a rudder should be negative in view of the risks of icing. Revision of 12,403, 9 June 1949. ARC CP 42.

Instruments

EXPERIMENTAL INVESTIGATION OF TRANSONIC FLOW PAST TWO-DIMENSIONAL WEDGE AND CIRCULAR-ARC SECTIONS USING A MACHZEHNDER INTERFEROMETER, by Arthur Earl Bryson, Jr U. S. National Advisory Committee for Aeronautics. Nov 1951. 97p photos, diagrs, graphs Microfilm $4.25, Photostat $12.50. PB 105755

Interferometer measurements are given of the flow fields near two-dimensional wedge and circular-arc sections at zero angle of attack. Pressure distributions and drag coefficients as functions of Mach number were obtained and the wedge data are compared with theory. It is shown that the local Mach number at any point on the surface of a finite three dimensional body or an unswept two-dimensional body, moving through an infinite fluid, has a stationary value at Mach number 1 and, in fact, remains nearly constant for a range of speeds below and above Mach number 1. On the basis of this concept and the ex-

perimental data, pressure distributions and drag coefficients for the wedge and circular-arc sections are presented throughout the entire transonic range of velocities. NACA TN 2560.

FOCUSSING SCHLIEREN SYSTEMS, by R. W. Fish and K. Parnham. Gt. Brit. Ministry of Supply. Aeronautical Research Council. 1951. 17p diagrs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.90. PB 105414

The substitution of grids for the usual knife edges in a Schlieren apparatus confers focussing properties on the system. Three possible systems are described and their optical limitations discussed. Achromatic lenses are used in place of mirrors because of the excessive off-axis aberrations of the mirrors. Some practical suggestions for the construction of the grid and the adjustment of the system are given. S. O. Code no. 23-9006-54. ARC CP 54.

NOTE ON DEFINITIONS OF AND NOMENCLATURE FOR "AIR SPEEDS", BY THE STAFF OF THE AEROPLANE AND ARMAMENT EXPERIMENTAL ESTABLISHMENT. Gt. Brit. Ministry of Supply. Aeronautical Research Council. 1951. 8p Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.35. PB 105675

1. Airspeed - Calculation - Gt. Brit. 2. Airspeed indicators - Calibration - Gt. Brit. 3. ARC CP 49.

S. O. Code no. 23-9006-49. Appendix to ARC 13,570.

RECOGNITION TIME FOR DIAL-TYPE NUMERALS AS A FUNCTION OF SIZE AND BRIGHTNESS, by Mason N. Crook and Frances Schulze Baxter. U. S. Air Development Force. Research Division. Aero-Medical Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio. Mar 1951. 29p graphs, tables Microfilm $2.00, Photostat $3.75. PB 105508

Recognition time as a function of digit size and brightness was determined for white dial type digits on a dark ground. The brightness range was from 0.003 to 0.1 foot-lambert. Average recognition time under the most favorable conditions tried was about 0.6 second. As size or brightness decreased, recognition time increased, at first slowly and then more rapidly. The effect of such secondary factors as individual differences, grouping of digits, and reduction in brightness contrast was relatively small when size-brightness conditions were favorable, but tended to be much larger when size-brightness conditions became difficult. So far as the variables here investigated are concerned, it would be desirable to maintain operational conditions such that single digits would be recognized by the median subject within about 0.7 second. The necessary size-brightness combinations, however, would involve complications with space limitations and dark adaptation, so practical compromises are necessary. Contract no. W-33-038-ac-14559 with Institute for Applied Experimental Psychology, Tufts College. AAF TR 6465.

WIND-TUNNEL INVESTIGATION OF SIX SHIELDED TOTAL-PRESSURE TUBES AT HIGH ANGLES OF ATTACK, SUBSONIC SPEEDS, by Walter R. Russell, William Gracey, William Letko and Paul G. Fournier. U. S. National Advisory Committee for Aeronautics. Nov 1951. 25p diagrs, graphs, table Microfilm $2.00, Photostat $3.75. PB 105688

Calibrations of six shielded total-pressure tubes over an angle-of-attack range of -30° to 65° at Mach numbers of 0.26, 0.50, 0.70, 0.90, and 0.95 are presented. One of these tubes was a standard Kiel design, while the other tubes were variations of this design. The design variables which were investigated included the shape of the venturi entry (conical and curved), the position of the total-pressure probe with respect to the leading edge of the shield, the internal diameter of the shield, and the shape of the leading-edge profile. The effect of these variables on the range of angle of attack over which the tubes remained insensitive to inclination is discussed. NACA TN 2530.

Engines and Propellers

EXPERIMENTAL APPROACH TO THE PROBLEMS OF SHAFT WHIRLING, by E. Downham. Gt. Brit. Ministry of Supply. Aeronautical Research Council. 1951. 9p photos Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.65. PB 105618

The theoretical and practical aspects of shaft whirling are discussed and a brief survey is given of past work. A new experimental approach to the problem is suggested and discussed. A detailed programme of experiments is outlined. The design of model test rigs is also considered and a description is given of a rig built at the R.A.E. for investigating the theory of shaft whirling. S. O. Code no. 23-9006-55. ARC CP 55.

REVISED HIGH-SPEED LIFT AND DRAG DATA FOR CLARK Y SECTIONS FOR PROPELLER PERFORMANCE CALCULATIONS, by A.R.C. MacDougall. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Jan 1947. 17p graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.25. PB 105332

1. Propellers - Lift - Gt. Brit. 2. Propellers - Drag - Gt. Brit. 3. Clark Y (Airplane) 4. Mach number - Effect - Gt. Brit. 5. Wind tunnel tests - Gt. Brit. 6. Airplanes - Models - Tests - Gt. Brit. 7. Propellers - Model tests - Gt. Brit. 8. ARC RM 2474.

Cover date is 1951. S. O. Code no. 23-2474.

TESTS OF MODEL PROPELLERS IN THE HIGH SPEED TUNNEL THRUST AND TORQUE MEASUREMENTS ON A 2-BLADE, 6 PER CENT. THICK, CLARK Y SECTION PROPELLER, BY G. S. HISLOP, AND J. CALDWELL; WITH AN APPENDIX by M. Jones. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Nov 1945. 44p photos, diagrs, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $2.65. PB 105340

1. Clark Y (Airplane) 2. Airplanes - Models - Tests - Gt. Brit. 3. Propellers - Model tests - Gt. Brit. 4. Mach number - Effect - Gt. Brit. 5. Wind tunnels, High speed - Tests - Gt. Brit. 6. Propellers - Thrust - Measurements - Gt. Brit. 7. Torque, Propeller - Measurements - Gt. Brit. 8. ARC RM 2595.

Cover date is 1951. S. O. Code no. 23-2595. Appendix I. Notes on blockage corrections, by M. Jones. - Appendix II. Corrections to thrust observations. - Appendix III. Calibration of motor.

STRAIN GAUGE INVESTIGATION OF PROPELLER FLUTTER, by L.H.G. Sterne, H. G. Ewing and J. Kettlewell. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Jan 1947. 7p diagrs, graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.50. PB 105677

This report describes strain-gauge tests on a fluttering propeller. The tests were made on the No. 3 spinning tower and also in the large wind tunnel at the Royal Aircraft Establishment. The propeller blades were made of compressed wood. Both low incidence and stalling flutter were detected, and examples of the wave forms recorded by an oscilloscope and corresponding to each type of flutter are given. S. O. Code no. 23-2472. Cover date is 1951. ARC RM 2472.

Aerodynamics

AERO-ELASTIC STABILITY OF SUPERSONIC WINGS. REPORT NO. 4: SOME EXACT SOLUTIONS BASED ON PLATE THEORY, by M. A. Biot. Cornell Aeronautical Laboratory, Inc., Buffalo, N. Y. Nov 1949. 32p diagrs, graphs Microfilm $2.25, Photostat $5.00. PB 105321

1. Stability - Calculations 2. Plates, Flat - Aerodynamics 3. CAL CM-580.

ANALYSIS OF AN AXIAL COMPRESSOR STAGE WITH INFINITESIMAL AND FINITE BLADE SPACING, by H. J. Reissner and L. Meyerhoff. U. S. National Advisory Committee for Aeronautics. Oct 1951. 32p diagrs Microfilm $2.25, Photostat $5.00. PB 105537

A method of designing circular blade systems of finite spacing is developed. First, the theory of flow through a system of infinitesimally spaced surfaces is formulated by means of a continuous axially symmetric force field which is uniform in the circumferential direction. This force field replaces the effect of the blade system, with its hub and shroud boundary surfaces. Second, the force field in the space between the blades, hub, and shroud is replaced in the equations of finite spacing by inertia and pressure terms, which were omitted in equations of infinitesimal spacing. These terms will change values of flow variables of infinitesimal spacing. NACA TN 2493.

CALCULATION OF HIGHER APPROXIMATIONS FOR TWO-DIMENSIONAL COMPRESSIBLE FLOW BY A SIMPLIFIED ITERATION PROCESS, by W. H. Braun and M. M. Klein. U. S. National Advisory Committee for Aeronautics. Oct 1951. 54p diagrs, tables Microfilm $2.75, Photostat $7.50. PB 104952

The iteration equations for a simplified solution of the nonlinear compressible-flow equation are developed and applied to two profiles, the ellipse and the Kaplan section. Limitations imposed on the solutions by simplifications in the differential equation and the boundary conditions are discussed. The velocities near the midchord, the critical and potential limit free-stream Mach numbers, and the extent of isentropic supersonic regions are calculated to four approximations for the Kaplan section and to six approximations for the ellipse. The development of the iteration equations and the presentation of the results are made in conformity with the Karman transonic similarity law and comparisons are made with other solutions. NACA TN 2511.

CALCULATION OF MANOEUVRING TAIL LOADS BY THE INVERSE METHOD, by Bernard Etkin and Frank A. Woodward. National Research Council of Canada. 1951. 25p graphs, tables Available from National Research Council of Canada, Ottawa, Canada. $.20. PB 105562

A method of calculating elevator angles and tail loads in pull-up type manoeuvres is presented. The type of manoeuvre is specified by an assumed time history of the load factor increment. The severity of the manoeuvre is determined by the maximum load factor increment and the time to attain it. Once the relevant aeroplane parameters have been determined, and the type and severity of manoeuvre chosen, the solution is reduced to a simple and rapid tabular computation. Aeronautical report AR-8. NRCC 2442.

COMPRESSIBILITY EFFECTS ON DRAG. AIR DRAG: THEORETICAL AND PRACTICAL DATA ON AERODYNAMIC DRAG (VOLUME 10 OF A 12-VOLUME WORK), by Dr. Sighard F. Hoerner. n.d. 95p Microfilm $4.25, Photostat $12.50. PB 104348

1. Drag - Compressibility effects 2. Drag, Aerodynamic - Induced 3. Drag, Aerodynamic - Skin friction 4. Drag, Aerodynamic - Pressure. 5. AAF TR 1188.

Project no. KA-243.

EFFECT OF FUSELAGE AND TAIL SURFACES ON LOW-SPEED YAWING CHARACTERISTICS OF A SWEPT-WING MODEL AS DETERMINED IN CURVED-FLOW TEST SECTION OF LANGLEY STABILITY TUNNEL, by John D. Bird, Byron M. Jaquet and John W. Cowan. U. S. National Advisory Committee for Aeronautics. Oct 1951. 19p photos, diagrs, graphs Microfilm $1.75, Photostat $2.50. PB 105473

Results are presented of a wind-tunnel investigation made to determine the influence of the fuselage and tail surfaces on the rotary derivatives in yawing flight of a transonic-airplane configuration having 45° sweptback wing and tail surfaces. The tests were run in the curved-flow test section of the Langley stability tunnel at a Reynolds number of 1.07×10^{6} and consisted of balance measurements throughout the angle-of-attack range for several flight-path radii of curvature. The results are compared with data from forced-oscillation and free-oscillation tests, and a description of testing techniques used is included. Supersedes the recently declassified RM L8G13, "Effect of fuselage and tail surfaces on low-speed yawing characteristics of a swept-wing model as determined in curved-flow test section of Langley stability tunnel", by John D. Bird, Byron M. Jaquet. and John M. Cowan, 1948. NACA TN 2483.

GRAPHICAL METHOD FOR PLOTTING AMPLITUDE AND PHASE ANGLE OF TRANSFER FUNCTIONS OF DYNAMIC SYSTEMS WITHOUT FACTORING POLYNOMIALS, by Earl F. Smith. U. S. National Advisory Committee for Aeronautics. Nov 1951. 35p diagr, graphs, tables Microfilm $2.25, Photostat $5.00. PB 105573

A method is presented for obtaining amplitude and angle plots for rational algebraic functions of an imaginary variable. The method involves the use of templets but does not require the factoring of polynomials. Application of the method is illustrated by an example in which the frequency response of an aircraft and automatic control system is plotted. NACA TN 2522.

KRUCHEMIE I IZGIB PRISMATICHESKIKH STERZHNEI S POLYM PRYAMOUGOL'NYM SECHENIEM (TORSION AND BENDING OF PRISMATIC RODS OF HOLLOW RECTANGULAR SECTION), by B. L. Abramyan. Nov 1951. 24p diagrs, tables Microfilm $2.00, Photostat $3.75. PB 105804

The torsion and bending of hollow rectangular beams was investigated without the requirement that the wall thickness be small compared with the transverse dimensions. The limits of applicability of the usual Bredt formula are indicated for the case of a square hollow tube in torsion. Formulas are given for bending stresses at different parts of the cross section of a hollow rectangular beam. Translated from Prikladnaya Mathematika i Mekhanika v. 14, no. 3, 1950, p. 265-276. NACA TM 1319.

METHOD FOR PREDICTING THE UPWASH ANGLES INDUCED AT THE PROPELLER PLANE OF A COMBINATION OF BODIES WITH AN UNSWEPT WING, by Paul F. Yaggy. U. S. National Advisory Committee for Aeronautics. Oct 1951. 25p photos, drawings, graphs Microfilm $2.00, Photostat $3.75. PB 105542

An approximate method for predicting the upwash angles induced at the horizontal center line of the propeller disk of a twin-engine airplane is developed and is shown to be satisfactory. The applicability of the method to other airplanes is discussed. NACA TN 2528.

RESUME OF AERODYNAMIC DATA ON AIR BRAKES, by H. Davies and F. N. Kirk. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Jun 1942. 22p diagrs, drawings, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.40. PB 105224

A collection has been made of aerodynamic data on air brakes. The characteristics of wing brake flaps have been analysed, including the effect of venting or perforating the flaps. In particular, the design of brake flaps so as to have no appreciable effect on lift or trim is discussed, and in this connection the relative merits of double split trailing-edge flaps, Youngman flaps, air brakes behind the tail, etc., are compared. A brief description of some methods of balancing brake flaps is given. The small amount of data available on wing and tail buffeting due to brake flaps has also been analysed. Cover date is 1951. S.O. Code no. 23-2614. ARC RM 2614.

SIMPLIFIED METHOD FOR CALCULATION OF COMPRESSIBLE LAMINAR BOUNDARY LAYER WITH ARBITRARY FREE-STREAM PRESSURE GRADIENT, by George M. Low. U. S. National Advisory Committee for Aeronautics. Oct 1951. 28p graphs, tables Microfilm $2.00, Photostat $3.75. PB 105498

The Karman-Polhausen method, as applied to compressible laminar boundary layers, is simplified by an analysis similar to the incompressible Holstein-Bohlen method. The analysis is carried out under the assumptions of a Prandtl number of 1, zero heat transfer, and a linear viscosity-temperature relation. Results are presented so that velocity and temperature profiles, momentum and displacement thicknesses, and wall shear stress can be calculated for flows over two-dimensional bodies with arbitrary free-stream velocity distributions. The results are also applicable to flows over three-dimensional bodies with axial symmetry through the use of Mangler's transformation. NACA TN 2531.

SOME FEATURES OF ARTIFICALLY THICKENED FULLY DEVELOPED TURBULENT BOUNDARY LAYERS WITH ZERO PRESSURE GRADIENT, by P. S. Kelbanoff and Z. W. Diehl. U. S. National Advisory Committee for Aeronautics. Oct 1951. 55p photos, diagr, graphs Microfilm $2.75, Photostat $7.50. PB 105418

Results are presented of tests to determine the feasibility of artifically thickening a turbulent boundary layer on a flat plate. It is shown that it is possible to do substantial thickening and obtain a fully developed turbulent boundary layer which is free from any distortions introduced by the thickening process. Measurements of mean velocity, spectrum of u-fluctuation, and intensity of u-fluctuation are presented. Some features of the fully developed turbulent boundary layer with zero pressure gradient are discussed. The mean flow in the boundary layer is compared with the logarithmic laws of mean-velocity distribution derived for pipes and channels, and the existing theories dealing with the shape of the spectrum in isotropic turbulence are applied to the spectrum measured in the outer portion of the boundary layer. NACA TN 2475.

WIND-TUNNEL INVESTIGATION OF EFFECTS OF VARIOUS AERODYNAMIC BALANCE SHAPES AND SWEEPBACK ON CONTROL-SURFACE CHARACTERISTICS OF SEMISPAN TAIL SURFACES WITH NACA 0009, 0015, 66-009,66(215)-014, AND CIRCULAR-ARC AIRFOIL SECTIONS, by John J. Harper. U. S. National Advisory Committee for Aeronautics. Oct 1951. 127p photos, diagrs, graphs, tables Microfilm $5.00, Photostat $16.25. PB 105495

A summary of force data on unswept and sweptback airplane control surfaces is presented. Lift and hinge-moment characteristics were determined for four unswept, semispan control surfaces, and lift, drag, hinge moment, and pitching moment were determined for two semispan, sweptback control surfaces. These control surfaces were of the wide-chord type suitable for use as elevators or rudders. Measured values of the various parameters are compared with those obtained from section data by application of lifting-surface and lifting-line theory. NACA TN 2495.

CLEAVAGE FRACTURES OF SHIP PLATES, by Wilbur M. Wilson, Robert A. Hechtman, and Walter H. Bruckner. Illinois. Engineering Experiment Station, Urbana, Ill. Mar 1951. 94p photos, diagrs, graphs, tables Available from Engineering Experiment Station, University of Illinois, Urbana, Ill. $1.00. PB 105162

1. Ships - Plates - Fractures 2. ILU EES B388.

Investigation conducted in cooperation with the Ship Structure Committee, National Research Council.

L'ELICA A PASSO VARIABLE E I SUOI DISPOSITIVI DI MANOVRA E DI REGOLAZIONO. (VARIABLE PITCH PROPELLER AND ITS MANEUVERING AND ADJUSTING DEVICES), by S. Filippini and (Mr.) Montalenti. May 1951. 21p photos, drawings, graphs Microfilm $2.00, Photostat $3.75. PB 105175

1. Propellers, Variable pitch - Italy 2. NAVSHIPS T 412.

Chapters 3 and 4 of: "The four 2000-ton motor ships for the coastal service between Bergen and Kirkenes", by Filippini and Montalenti. Translation from Fiat Bollentino Technico, no. 3, 1950, pp. 73-82, by F. Rizzo, Bureau of Ships, May 1951.

WATER SUPPLY, SANITATION AND PUBLIC HEALTH

AIR ENTRAINMENT IN FLOWING WATER, A SUMMARY AND BIBLIOGRAPHY OF LITERATURE, PREPARED BY OWEN P. LAMB. SUBMITTED by Lorenz G. Straub. Minnesota. University. St. Anthony Falls Hydraulic Laboratory. Aug 1949. 47p Microfilm $2.50, Photostat $6.25. PB 105061

1. Water - Air content - Measurement 2. Flow, Fluid - Air entrainment 3. Gas-liquid mixtures - Analysis.

Project report no. 19. First technical report prepared under Contract N6onr-246, Task order 6.

GROUND WATER SUPPLY OF PROSPECT VALLEY, COLORADO, by W. E. Code. Colorado. Agricultural Experiment Station. Oct 1945. 40p photos, diagr, maps, graphs, tables Available from Colorado Agricultural Experiment Station, Colorado A and M College, Fort Collins, Colo. PB 105526

1. Water, Ground - Colorado.

Technical bulletin 34.

HYDRAULIC RESEARCH IN THE UNITED STATES, ED. by Helen K. Middleton and Sonya W. Matchett. U. S. National Bureau of Standards. Aug 1951. 201p photo Available from Superintendent of Documents, Government Printing Office, Washington 25, D. C. $1.25. PB 105171

1. Hydraulics - Research 2. NBS MP 201.

REPORT OF THE WATER POLLUTION RESEARCH BOARD WITH THE REPORT OF THE DIRECTOR OF WATER POLLUTION RESEARCH FOR THE YEAR 1950. Gt. Brit. Dept. of Scientific and Industrial Research Water Pollution Research Board. 1951. 47p graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.40. PB 105617

1. Water - Pollution - Gt. Brit. 2. Sewage - Purification - Gt. Brit. 3. Trade waste - Purification - Gt. Brit.

S. O. Code no. 47-72-0-50.

REPORT ON GROUND WATER FOR IRRIGATION OF BIG SANDY VALLEY, COLORADO, by W. E. Code. Colorado. Agricultural Experiment Station. Dec 1945. 24p fold map, tables Available from Colorado Agricultural Experiment Station, Colorado A and M College, Fort Collins, Colo. PB 105525

1. Water, Ground - Colorado 2. Irrigation - Colorado.

Miscellaneous series paper no. 282.

USE OF GROUND WATER FOR IRRIGATION IN THE SOUTH PLATTE VALLEY OF COLORADO, by W. E. Code. Colorado. Agricultural Experiment Station. Sep 1943. 48p photos, diagr, fold map, graphs, tables Available from Colorado Agricultural Experiment Station, Colorado A and M College, Fort Collins, Colo. PB 105528

1. Irrigation - Colorado 2. Water, Ground - Colorado.

Bulletin 483.

WHEN TO USE SPRINKLER IRRIGATION IN COLORADO, by W. E. Code and A. J. Hamman. Colorado. Agricultural Experiment Station. Jun 1950. 19p photos, diagr, table Available from Colorado Agricultural Experiment Station, Colorado A and M College, Fort Collins, Colo. PB 105527

1. Irrigation, Sprinkler - Colorado.

Bulletin 405-A.

X-RAY DIFFRACTION STUDY OF THE INTERNAL STRUCTURE OF SUPERCOOLED WATER, by Robert G. Dorsch and Bemrose Boyd. U. S. National Advisory Committee for Aeronautics. Oct 1951. 14p photo, diagr, graphs Microfilm $1.75, Photostat $2.50. PB 105513

X-ray diffraction data for water in the temperature range 21° to -16°C are presented. The minimum between the two main diffraction peaks deepened continuously, as the temperature was lowered. It is concluded that supercooled water apparently becomes progressively more ice-like in structure as the temperature is lowered. NACA TN 2532.

MISCELLANEOUS

ACCOUNTING AND AUDITING METHODS OF JAPANESE AGRICULTURAL COOPERATIVES, by John C. Essene. Supreme Commander for the Allied Powers. Natural Resources Section. Sep 1951. 95p tables Microfilm $4.25, Photostat $12.50. PB 105324

1. Accounting - Methods - Japan 2. Auditing - Japan 3. Agricultural cooperative associations - Japan 4. SCAP NRS PS 65.

ANALYSIS FOR THREE-DIMENSIONAL PIPE STRUCTURES BY GROUP RELAXATION, by R. C. DeHart and Nicholas Bassar, Jr. Montana. Engineering Experiment Station, Bozeman, Mont. Nov 1950. 11p diagrs, tables Available from The Director, Montana State College Engineering Experiment Station, Bozeman, Mont. PB 105235

1. Pipe - Elasticity 2. MO EES B9.

BIBLIOGRAPHY ON THE RELATION OF MOSQUITOES TO VEGETATION IN THE EURASIAN ARCTIC AND SUBARCTIC, by Artheme Dutilly. U. S. Office of the Quartermaster General. Military Planning Division. Research and Development Branch. Environmental Protection Section. Jan 1950. 113p Microfilm $4.75, Photostat $15.00. PB 105499

1. Mosquitoes - Relation to vegetation - Bibliography 2. Mosquitoes - Arctic regions - Bibliography 3. QMC EPS 162.

Contract W44-109-qm-1297.

CANDLES, by Lackland Beeding. U. S. Office of Technical Services. Oct 1951. 11p table Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. Mimeo: $.35. PB 105347

DETERMINATION OF CRITERIA OF READABILITY. TECHNICAL REPORT FOR CONTRACT NR 153-024, by Ray C. Hackman and Alan M. Kershner. Maryland. University, College Park, Md. n.d. 61p graph, tables Microfilm $3.00, Photostat $8.75. PB 104805

1. Readability.

ENGINEERING PROGRESS AT THE UNIVERSITY OF FLORIDA, V. 5, NO. 8. Florida. Engineering and Industrial Experiment Station, Gainesville, Florida. Aug 1951. 15p photos, diagr, graphs, tables Available from Florida Engineering and Industrial Experiment Station, University of Florida, Gainesville, Fla. PB 105161

1. Natural resources - Florida 2. Paper - Insect proofing 3. Textiles - Insect proofing 4. Pumps, Earth heat 5. Oscillographs - Sweep circuits 6. Recorders, Sound.

Contents: Technical paper no. 60: Protection of paper and textile products from insect damage, by S. S. Block (Reprinted from Industrial and Engineering Chemistry, vol. 43, no. 7, Jul 1951). - Technical paper no. 61: An atmospherics waveform receiver, by William J. Kessler and Sydney E. Smith (Reprinted from Proceedings of the I.R.E., vol. 39, no. 6, June 1951). - Leaflet series no. 29: What, where, and how much, by Ralph A. Morgen (Reprinted from Florida speaks, vol. 3, no. 2, Apr 1951). - Leaflet series no. 30: The heat pump-a gold mine? by George E. Sutton (Reprinted from Science counselor, vol. 14, no. 2, June 1951.

GERMAN CATGUT MANUFACTURE, REPORTED by Edward E. Natali, Nathan Tugmann, Michael M. Stein. British Intelligence Objectives Sub-Committee. B.I.O.S. trip no. 2524. 1946. 32f photos Microfilm $2.25, Enlargement Print $6.25. PB 105728

1. Catgut - Manufacture - Germany 2. Pirazzi, Gustav & Co., Offenbach, Ger. 3. BIOS FR 1873 4. Micro BIOS DOCS 2524/1020 5. Micro BIOS FD 2279/49, Frames 1-31.

Abstract included.

GERMAN MECHANICAL LIGHTER INDUSTRY, REPORTED BY B. T. SANDOR. B.I.O.S. TRIP NO. 2910, 23 NOV TO 15 DEC 1946. BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE. PUBLISHED BY THE BRITISH MECHANICAL LIGHTER TRADE ASSOCIATION. Dec 1946. 43f photos, drawings Microfilm $2.50, Enlargement Print $7.50. PB 105719

1. Lighters - Manufacture - Germany 2. British Mechanical Lighter Trade Association 3. BIOS FR 1732 4. Micro BIOS FD 857/49, Frames 1-31+9.

Abstract included.

GERMAN PIANO INDUSTRY, REPORTED by W. Evans and W. S. Watts. British Intelligence Objectives Sub-Committee. n.d. 7f Microfilm $1.25, Enlargement Print $2.50. PB 105649

1. Pianos - Manufacture - Germany 2. BIOS FR 906 3. Micro BIOS FD 3081/48, Frames 1-7.

PELAGIC FUR SEAL RESEARCH OFF JAPAN IN 1950, by Ford Wilke. Supreme Commander for the Allied Powers. Natural Resources Section. Oct 1951. 38p photos, maps, graphs, tables Microfilm $2.25, Photostat $5.00. PB 105631

1. Seals (Animal) - Fur - Japan 2. SCAP NRS PS67.

PREPARATION FOR DEFENSE, by A. von Hippel, illustrated by H. B. Kane. Massachusetts Institute of Technology. Laboratory for Insulation Research. Nov 1950. 11p drawings Microfilm $1.75, Photostat $2.50. PB 104810

1. Defences 2. Specifications 3. MIT LIR TR 40.

ONR Contract N5 ori-07801. Presented at the annual meeting of the Conference on Electrical Insulation, National Research Council, Pocono Manor, Pa., Nov 1, 1950.

RECONNAISSANCE SOIL SURVEY OF JAPAN: HOKKAIDO, by Thomas M. Bushnell and Thomas E. Ritchie. Supreme Commander for the Allied Powers. Natural Resources Section. Aug 1951. 133p fold. col. maps, tables (1 fold) Microfilm $5.50, Photostat $17.50. PB 105346

1. Soils - Surveys - Japan 2. SCAP NRS 110-H.

REPORT OF THE FIRE RESEARCH BOARD WITH THE REPORT OF THE DIRECTOR OF FIRE RESEARCH FOR THE YEAR 1950. Gt. Brit. Fire Research Board. 1951. 59p photos, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.65. PB 105326

1. Fire protection - Research - Gt. Brit. 2. Combustion - Research - Gt. Brit.

Cover title: Fire research 1950. S. O. Code no. 47-151-0-50.

REPORT OF THE MECHANICAL ENGINEERING RESEARCH BOARD, WITH THE REPORT OF THE DIRECTOR OF MECHANICAL ENGINEERING RESEARCH FOR THE PERIOD MAY 1947 TO DECEMBER 1950. Gt. Brit. Dept. of Scientific and Industrial Research. Mechanical Engineering Research Board. 1951. 49p photos, diagrs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.65. PB 105331

1. Mechanical engineering - Research - Gt. Brit. S. O. Code no. 47-163-0-50.

REPORT ON MACHINE FOR MAKING COAT-HANGER HOOKS. British Intelligence Objectives Sub-Committee. 1947. 11f photos, drawings Microfilm $1.75, Enlargement Print $3.75. PB 105721

1. Hohage, C., & Cie, Altroggenrahmelie 2. Hooks, Coat hanger - Manufacture - Germany 3. BIOS FR 1676 4. Micro BIOS FD 960/49, Frames 1-9.

Abstract included.

SYMPOSIUM ON APPLICATIONS OF AUTOCORRELATION ANALYSIS TO PHYSICAL PROBLEMS, WOODS HOLE, MASS., 13-14 JUNE 1949. U. S. Office of Naval Research. May 1950. 82p photos, diagrs, graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $2.25. PB 105341

1. Autocorrelation - Analysis 2. Correlation functions 3. Mathematical equations and solutions 4. Fourier analysis 5. Random functions 6. Time series (Statistics) 7. Communications - Theory 8. Noise, Random 9. Fire control equipment - Design 10. Recorders, Time interval 11. Waves, Ocean - Frequency measurement 12. Woods Hole Oceanographic Institution, Woods Hole, Mass. 13. NAVEXOS P-735.

Not all the papers presented are included. Contents: Correlation of Ayres' Index of American business activity, by Edwin B. Wilson. - Communication applications of correlation analysis, by Y.W. Lee. - Noise and nonlinear communication problems, by David Middleton. - Use of autocorrelation functions in fire-control system design, by G. F. Floyd, Jr. - Sampling theory of power spectrum estimates, by John W. Tukey. - System for recording and analyzing random processes, by Philip Rudnick. - Ocean wave analyses, by H. R. Seiwell. (Abstract of paper published in Proc. Nat. Acad. Sci. 35, no. 9 (1949) p. 518-528.

USE AND MAINTENANCE OF INDIVIDUAL LAND SURVIVAL KITS, by N. K. Hanselman. U. S. Air Materiel Command. Engineering Division. Aero-Medical Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio. Mar 1951. 20p photos, tables Microfilm $1.75, Photostat $2.00. PB 103811

1. Kits, Aircraft - Survival 2. AAF TSEAA MR 670-20K.

MCREXD-670-20K.

VULNERABILITY STUDY OF LIQUID OXYGEN CONVERTERS, by Vincent B. Diebold. U. S. Air Development Force. Research Division. Aero-Medical Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio. Apr 1951. 8p tables Microfilm $1.25, Photostat $1.25. PB 104060

1. Converters, Liquid oxygen - Vulnerability 2. Oxygen, Liquid - Storage - Safety 3. AAF TSEAA MR 660-104-L.

PATENTS

Chemical and Allied Products

AROMATIZATION AND DEHYDROGENATION CATALYSTS. PATENT APPLICATION NO. R114653 IVd/23b. Ruhrchemie A. G., Oberhausen-Holten, Ger. Aug 1943. 5p Microfilm $1.25, Photostat $1.25. PB 103779

1. Catalysts, Aromatization - Patents - Germany 2. Catalysts, Dehydrogenation - Germany 3. Patents - Germany R114653 IVd/23b, Aug 20, 1943 4. Micro TOM 297, Frames 7896-7902, translation.

Translated by M. Beth, Sinclair Refining Co. Research and Development Dept., Jan 4, 1951. Translation book 1950-169.

AROMATIZATION OF HYDROCARBONS, ETC. (PATENT CLAIMS). Ruhrchemie A. G., Oberhausen-Holten, Ger. 1938-1943. 56f drawings (Text in German) Microfilm $2.75, Englargement Print $8.75. PB 103876

1. Hydrocarbons, Aromatic - Production - Patents - Germany 2. Patents - Germany R102102 IVd/236 Apr 2, 1938 3. Patents - Germany - R103240 IVd/23c, Aug 29, 1938 4. Patents - Germany R103379 IVd/120, Sep 1938 5. Patents - Germany R104540 IVd/236, Feb 14, 1939 6. Patents - Germany R104875, Mar 24, 1939. 7. Patents - Germany R104946 IVd/23o Apr 5, 1946 8. Patents - Germany R104998 Apr 14, 1939 9. Patents - Germany R106467 IV/236 Nov 22, 1939 10. Micro BIOS FD 5456/47, Frames 1-56.

Abstract available as PB 103876s. 2p. Microfilm $1.25, Photostat $1.25.

METHOD FOR THE ISOMERIZATION OF N-BUTANE. I. G. Farbenindustrie A. G., Ludwigshafen, Ger. Patent O.Z. 14150. May 1943. 2p Microfilm $1.25, Photostat $1.25. PB 103784

1. n-Butane - Isomerisation - Germany 2. n-Butane - Isomerisation - Patents - Germany 3. Patents - Germany O.Z. 14150 May 4, 1943 4. Micro TOM 300 frames 7331-7334, translation.

Translated by M. Beth, Sinclair Refining Co., Research and Development Dept. Translation book 1950-164.

PATENT APPLICATIONS AND PROCESSES FOR THE PRODUCTION OF TRICHLORETHYLENE. I. G. Farbenindustrie A. G., Schkopau, Ger. 1939-1942. 18f diagrs (Text in German) Microfilm $1.75, Enlargement Print $3.75. PB 103320

1. Ethylene, Trichloro - Production - Germany 2. Ethylene, Trichloro - Production - Patents - Germany 3. Ethylene, Tetrachloro - Production - Patents - Germany 4. Patents - Germany - Wo 3092 5. GP 651878 Dec 8, 1938 6. Micro BIOS FD 2675/47, Frames 1-15.

UNIVERSITY OF MICHIGAN LIBRARIES

English abstract included. Abstract available as PB 103320s. 2p. Microfilm $1.25, Photostat $1.25. Includes report by Dr. Hennig which appeared in shorter form in Micro BIOS FD 2664/47 (PB 103316).

PATENT APPLICATIONS RELATING TO MOTOR FUELS AND GLYCOLS. I. G. Farbenindustrie A. G., Ludwigshafen, Ger. 1940. 32f Microfilm $2.25, Enlargement Print $6.25. PB 104592

1. Fuels, Automotive - Patents - Germany 2. Fuels, Anti-knock - Patents - Germany 3. Glycols - Patents - Germany 4. Patents - Germany O.Z. 12116, Apr 24, 1940 5. Patents - Germany - O.Z. 12162, May 24, 1940 6. Patents - Germany - O.Z. 12193, June 11, 1940 7. Patents - Germany - O.Z. 12201, June 18, 1940 8. Patents - Germany - O.Z. 12260, June 19, 1940 9. Patents - Germany - O.Z. 12353, Sep 17, 1940 10. Patents - Germany - O. Z. 12230, July 2, 1940 11. Micro BIOS FD 2377/48, Frames 1-30.

English abstract included. Abstract available as PB 104592s. 2p. Microfilm $1.25, Photostat $1.25.

PATENT APPLICATIONS RELATING TO TETRAHYDROFUREN POLYMERIZATION PRODUCTS. I.G. Farbenindustrie A. G., Leverkusen, Ger. 1939-1940. 53f (Text in German) Microfilm $2.75, Enlargement Print $8.75. PB 105424

1. Furan, Tetrahydro - Polymerization - Patents - Germany 2. GP 741478 3. Patents - Germany F 64911 IVc/12q June 14, 1939 4. Patents - Germany F 65460 IVc/12q Aug 14, 1939 5. Patents - Germany F 65461 IVc/A2q Aug 14, 1939 6. Patents - Germany G 66204 IVc/12q Dec 28, 1939 7. Patents - Germany G 68294 IVc 12q Nov 11, 1940 8. Patents - Germany F 68431 IVc A2q Dec 9, 1940 9. Patents - Germany F 68550 IVc 12q Dec 28, 1940 11. Micro BIOS FD 1406/49, Frames 1-52.

English abstract included.

PATENT CLAIMS FOR THE PRODUCTION AND STABILIZATION OF 1.1-(AS-)DICHLORETHYLENE; FOR THE PRODUCTION OF VINYL CHLORIDE FROM DICHLORETHANE, AND OF DICHLORACETYLENE FROM TRICHLORETHYLENE, AND FOR THE PRODUCTION OF MONOALKYLENE-HYDRAZINES. I. G. Farbenindustrie A. G., Schkopau, Ger. 1940-1944. 27f (Text in German) Microfilm $2.00, Enlargement Print $5.00. PB 103318

1. Patents - France - 885877 2. Patents - Germany O. Z. 12312 Aug 17, 1940 3. Patents - Germany - I 67676 4. Patents - Germany - O. Z. 12587 Feb 20, 1941 5. Patents - Germany - I 68945 6. Ethylene, 1.1-Dichloro - Production - Patents - Germany 7. Acetylene, Dichloro - Preparation - Germany 8. Ethylene, Dichloro - Stabilizing agents - Germany 9. Hydrazine - Derivatives - Production - Patents - Germany 10. Vinyl chloride - Production - Patents - Germany 11. Micro BIOS FD 2672/47, Frames 1-26.

English abstract included. Abstract available as PB 103318s. 2p. Microfilm $1.25, Photostat $1.25.

16. WISSENSCHAFTLICHE AKO 12.12. 1941 IN HÖCHST. I. G. Farbenindustrie A. G., Ludwigshafen, Ger. Dec 1941. 161f photos, graphs (Text in German) Microfilm $6.25, Enlargement Print $22.50. PB 105193

1. Dyes, Azo - Manufacture - Germany 2. Dyes, Napthol AS - Manufacture - Germany 3. Dyes and dyeing - Oxidation reduction - Germany 4. Patents - Germany - J 67772 5. Patents - Germany - J 69070 6. Patents - Germany - J 69071 7. Patents - Germany - J 67434 8. Patents - Germany - I 70105 9. Patents - Germany - I 70104 10. Benzo fast copper green (Trade name) 11. AKO (Kommission für Azofarben) 12 Micro BIOS DOCS 2351/2247/1/10-16 13. Micro BIOS FD 521/50, Frames unnumbered 14. Micro BIOS FD 522/50, Frames unnumbered 15. Micro BIOS FD 523/50, Frames unnumbered 16. Micro BIOS FD 524/50, Frames unnumbered 17. Micro BIOS FD 525/50, Frames unnumbered 18. Micro BIOS FD 526/50, Frames unnumbered 19. Micro BIOS FD 527/50, Frames unnumbered.

For other reports of this meeting see PB 103295. English abstracts available as PB 105193s. 15p. Microfilm $1.75, Photostat $2.50. Micro BIOS FD numbers do not appear on film. Contents: Arbeiten auf dem azo-gebiet, Offenbach. - Bericht über das Naphthol AS gebiet, Offenbach. - Verzeichniss der referate Höchst. - Wolfen. Besprechung. - Sammelreferat Mainkur. - Nachtrag versuche zur herstellung einer benzoechtkupfergrüns (Attempts to produce a benzo fast copper green) by Dr. Fleischhauer and Dr. A. Müller. - Bericht des Wissen-en haupt Laboratorium, Leverkusen, by Dr. Kleine and Dr. Taube. - Sammelreferat Leverkusen Azo-Laboratorium. - Ueber oxydation-reduktions-potentiale (Oxidation reduction potentials) by Dr. Suckfüll.

Electrical Machinery, Equipment and Supplies

RINGSPANNUNGSTEILER FÜR WECHSELSTROMSCHALTUNGEN (CIVIL VOLTAGE DIVIDER FOR AC CONNECTION). Askania-Werke A. G., Berlin. Nov 1942. 36f diagr (Text in German) Microfilm $2.25, Enlargement Print $6.25. PB 103828

1. Voltage dividers - Patents - Japan 2. Voltage dividers - Patents - Germany 3. Patents - Germany A94488 VIIId/21d2 Nov 14, 1941 4. Iishida & Co., Tokyo.

Application for Japanese patent held by H. Iida & Co., Tokyo.

Instruments

NEUE JAPANISCHE PATENTANMELDUNG "KREISEL-MAGNET KOMPASS" A92,210 IXb/42c (GYROSCOPE MAGNETIC COMPASS). Askania-Werke A.G., Berlin. Oct 1940. 36f drawings, diagrs (Text in German, Japanese and English) Microfilm $2.25, Enlargement Print $6.25. PB 103836

1. Compasses, Gyro - Patents - Japan 2. Compasses, Gyro - Patents - Germany 3. Patents - Japan 2198 4. Patents - Germany A92,210 IXb/42c Oct 24, 1940 5. Micro NAVSHIPS S56-46.

Patent-abt. Jap 2198.